THE BUILDER

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Cranes.

IN the early days of mechanical engineering the crane was a particularly simple contrivance comprising an arm or jib, a post capable of being moved in a circular direction, a stay supporting the jib, a rotatory barrel or drum, and a chain or rope secured to the drum and passing over a wheel at the end of the jib. By attaching a weight to be lifted to the chain or rope and rotating the drum the weight could be raised from the ground and deposited in some other position by rotating the framework of the crane and uncoiling the chain or rope previously wound about the drum.

Although the resemblance is not remarkably striking the arm of this mechanical device was thought to be like the neck of the bird whose name has been borrowed for the purposes of terminology by the engineers of all nations. The development of modern crane construction has proceeded on lines which make the name thus derived far less descriptive than it was originally, and the types of apparatus available for successively raising, moving, and lowering weights are so numerous in the present day that it would be quite impossible to discuss them fully in any volume of moderate dimensions.

This point is illustrated by the publication of a bulky volume* on the construction, mechanical equipment, and working of cranes, translated from the German of Mr. Anton Böttcher, and supplemented by examples of crane construction in Great Britain, America, and elsewhere by the translator, Mr. A. Tolhausen.

Notwithstanding its imposing dimensions the book might easily have been increased in size, and in some respects with advantage, for while dealing at great length with German cranes British practice is by no means so fully illustrated, this part requiring considerable amplification to make the volume a complete epitome of crane construction in the three leading industrial countries of the world. Moreover, if the claims of France, Belgium, Switzerland, and other European countries were also noticed the proportions of the volume would be still further augmented.

Of course, we understand that the original author, merely writing for the German public, would naturally confine attention to German manufacturers. The translator, recognising the desirability of noticing for the benefit of English-speaking nations the leading productions of their own countries, has added matter relative to British and American cranes. These additions are of purely descriptive character, but as the theoretical treatment of the German author is very complete the reader will readily be able to apply it to other varieties of construction based upon the same fundamental principles.

Few structures demand greater attention than cranes to the correct adjustment of strength and stress. The designer must have adequate knowledge of statics, dynamics, and the strength of materials. The statics of crane building involve the composition and resolution of forces, the determination of equilibrium, the determination of the centre of gravity, and the determination of stresses in frames. The dynamics of crane building involve inquiry into the principal motions taking place, such as rectilinear movement in horizontal and vertical directions, and rotatory movement alone or in combination with rectilinear motion. Other dynamical problems are those connected with sliding and rolling friction, the stiffness of ropes and chains, and the action of various types of brakes, both mechanical and electrical.

These subjects, together with the strength of materials, are discussed by the author in special relation to crane design, his treatment being quite sufficient for the guidance of the draughtsman, and comprising formulæ and tables of useful character.

The demands made on the knowledge and skill of the designer have increased in a wonderful manner during recent years. Less than a hundred years ago the cranes generally used were of the jib type operated by means of a hollow wheel like a squirrel cage, in which a man walked forward to raise weights and backwards to lower them. Then came the first traversing crane built by Rennie at the West India Docks. Air and steam-driven cranes were introduced later, but the greatest impetus to modern crane design was given by Armstrong, who introduced water pressure as motive power, and by Fairbairn, whose constructive genius was applied with conspicuous success to this useful branch of practical engineering.

At the present time crane types exist in bewildering multiplicity, a fact

* "Cranes." Anton Böttcher and A. Tolhausen. London: Archibald Constable & Co., Ltd. 1908.

abundantly demonstrated by Parts II. and VI. of the work by Messrs. Böttcher and Tolhausen. Makers now exercise their ingenuity to produce cranes to suit the most varied requirements of users, the general arrangement of such machines depending upon the direction and distance of the movement to be made by the loads, the driving mechanism and speeds to be adopted, and the kind of material to be handled.

Local conditions are also taken into account in the design of many cranes. Foremost among these are the available space for travelling cranes, the slewing area at disposal for rotatory cranes, and the possibility of occasional or periodical reduction of the working areas. The designer considers also the modification necessitated by the possibility of simultaneous working on the part of several cranes in industrial establishments, the necessity for protection against the weather, heat, dust, and corrosive or noxious gases, and the special conditions affecting the design and operation of dock, harbour, and floating cranes.

Finally, the recent application of electricity as a motive power has opened the way for its use in a number of subsidiary operations formerly performed by hand power, and concurrently the convenience and success of electrically-driven cranes has led to more stringent demands in respect of machines operated in other ways.

Part II., entitled "General Arrangement of Cranes," and Part VI., on "Crane Installations," exemplify the great prolixity of crane types and variations. We cannot possibly allude to all these in detail, but to illustrate the wide scope of the treatise we give below an outline summary of the chief varieties included in the two main types of travelling and rotatory cranes.

The most simple form of travelling crane is that with an overhead girder on which runs a trolley with snatch-block operated by hand-power. By mounting the girder on supports running on rails and using crabs with wheel gear an efficient and convenient hand-power travelling crane is evolved. Before the introduction of electricity the shaft-driven travelling crane played an important part in most workshops. Appliances of this type are now practically obsolete, and in numerous cases have been converted for electrical operation. Single-motor electrically-driven travelling cranes are the direct descendants of power cranes driven by rope or shafting and so require no further comment. But multiple-motor cranes represented a new departure, each of the motions required being effected by a separate motor. The simple three-motor crane was the forerunner of large and heavy machines for purposes which could scarcely be achieved without the aid of electricity. Some noteworthy examples of such construction in Germany are furnished by the long-armed cranes built by the Duisburg Machine Works with the traverse of 282 ft., and the lift of 23 ft. above the ground; the Goliath of the Röchling Steel Works, with the span of 142 ft., and the height of 45 ft. to the crab rails; the coaling crane at Rhenan, built at the Beurath Machine Works, with the traverse of 356 ft., and the height of 34 ft. to the crab rails; two shipbuilding cranes at the Bremer Vulcan Works, having the radius of 83 ft. 8 in. for circular movements, the traverse of 174 ft., and the longitudinal travel of 606 ft.; and eight shipbuilding cranes at the Stettin Vulcan Works, with spans up to 49 ft., longitudinal travel up to 558 ft., and the average height of about 120 ft. above ground level. Many fine examples of similar cranes are furnished by machinery of British and American manufacture, illustrated and described by the authors in Part VI. of their book.

With the object of conducing to safety auxiliary hand-gear is sometimes applied to electric cranes. Composite driving gears embodying the use of hydraulic and steam power, or of hydraulic and electric power are also used in special cases.

Shaft-driven gear on swing cranes may now be regarded as obsolete, the use of steam power being confined in the present day to the operation of steam-driven gear. Hydraulic rotatory cranes are generally of the stationary or fixed type, and although some dock cranes are provided with a travelling motion hydraulic power is not applied in connexion therewith. Steam and electrically-driven cranes are made in great variety of the fixed and travelling types. The names given by users and makers to different patterns of steam and electric cranes are very confusing. They do not indicate the type of appliance so much as the use to which it is generally put, and in many cases they suggest nothing at all. The need for revised classification and nomenclature is clearly evidenced by the following list of names for steam and electric cranes given in the author's work: "Breakdown, coaling, contractor's, deck, derrick, dock, Fairbairn, floating, forge, foundry gantry, Goliah, grab, harbour, jib, long-radius, overhead, permanent-way, pillar, portable, portal, quarry, semi-portal, ship-building, shunting, Titan, warehouse, Wellington, wharf, yard-crane."

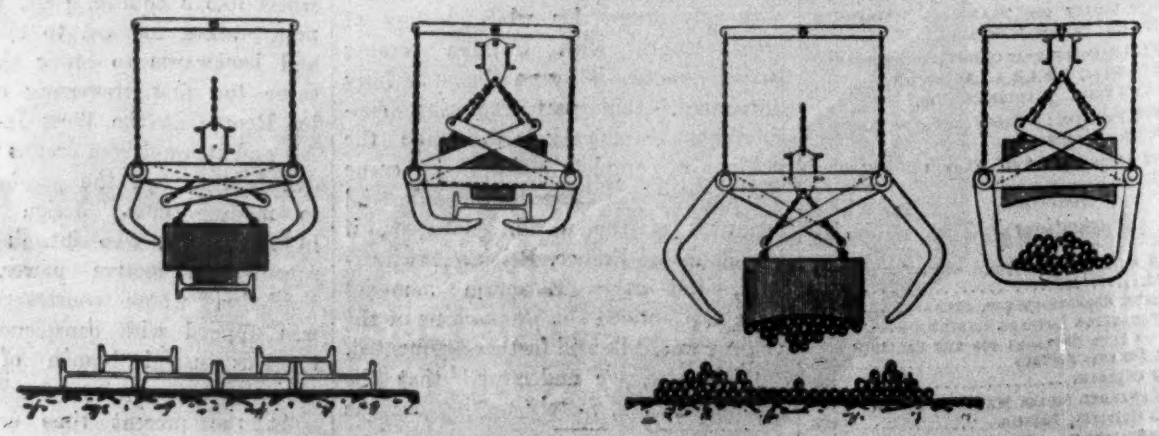
As in the case of travelling cranes proper, electrical driving has been found of immense convenience, and has been applied to a variety of typical purposes in rotatory cranes of all sizes, from the small workshop crane to the gigantic dock crane, capable of lifting a load of 150 tons to the height of 70 ft. and swinging it along a circle of 140 ft. diameter.

Sheer legs or mast cranes, constituting a third class of design, have long occupied an important place in dockyards. Owing to their limited performance and chiefly their inability to slew, sheer legs are far less useful for general purposes than some modern types of rotatory cranes.

For handling boilers, armour plate, and heavy guns in dockyards, and for dealing with rolling stock in railway practice, sheer legs may continue to be used, and in the form of a floating crane for loads exceeding 100 tons they will probably never be superseded owing to their comparatively low cost and simplicity.

Before leaving the general arrangement of cranes, we may usefully refer to some special accessories described by the authors. Grabbing tackle is now quite a familiar auxiliary of cranes employed in civil engineering and in the steam navvy or excavator.

Electro-magnets applied to cranes offer convenient aid in iron and steel works for picking up and moving ingots, plates, castings, guns, and iron or steel in any form. Of course if the electric current should be interrupted accidentally even for a moment the load will be dropped without warning of any kind. Hence magnets as originally applied should only be used for objects not liable to injury by shock and in places where no risk to workmen is involved. An improved arrangement of German origin is illustrated in the accompanying figures, reproduced from Messrs. Böttcher & Tolhausen's book. The magnets here are simply used for picking up and depositing the loads, which are supported during transport by hinged jaws working



Magnet "Grabs" Provided with Safety Claws.

underneath. Electro-magnets are made in Great Britain available for loads ranging between 5 cwt. and 60 cwt., and in addition to their utility in workshops such appliances are convenient for raising iron and steel objects submerged in water.

Besides the customary safety appliances on cranes, a device is sometimes introduced for the prevention of accidents by overrunning through want of care on the part of the driver. For lifting and slewing gears various safety appliances are employed, generally embodying automatic brakes set in operation by contact of the controlling lever with a projection a little before the maximum lift has been attained. Another safety appliance described is that invented by Messrs. Davy Bros. and T. E. Holmes, of Sheffield, and intended to prevent injury to a crane in consequence of the full stress of an excessive load being thrown upon the winding rope or chain, this device being applicable to cranes of every description. An excellent accessory is the overload detector of Messrs. Denison & Son, of Leeds, a neat appliance which can be attached above the hook of any crane. Immediately an excessive load is put on the hook the detector bell rings loudly and refuses to be silenced until the load is taken off. The bell will keep on ringing for half an hour if necessary, and when this device is used there can be no excuse for injury caused by excessive weights.

Crane weighing machines are valuable auxiliaries for saving labour and time, as the weights of objects lifted are automatically registered during the normal operation of the crane.

In Part III. the authors deal with the essential features of the various systems of operating cranes, and refer to the results of numerous tests and observations bearing upon this part of the subject. Permissible load speeds and working efficiencies, together with the requisite gear purchases for power transmission, are presented in tabular form for hand-driven and steam-driven cranes.

The most important properties of the motive power in hydraulic and electric cranes are clearly stated in a manner that should be found helpful to designers and users alike. The section devoted to electrical driving is a particularly valuable contribution to the literature of crane design.

After considering crane fittings and the smaller mechanical details with special regard to the requirements of various systems of driving and in reference to their actual performance, the authors give in Part V. two new methods of computation for the assistance of crane designers and builders. One is a method of ascertaining the moments of inertia for riveted sections of any shape by means of a "Universal Table," and the other is a method of determining stresses in the members of framed structures, the process enabling the user to find any required value for a member corresponding to any given load position in addition to the maximum value.

The table for calculating moments of inertia is printed as a supplement of eleven pages, and involves very little labour, providing all data are taken on the metric system of weights and measures. As this system is by no means universal in Great Britain, where engineers have not yet learned to think in mètres and grammes and in compound units of those factors, it is unfortunate that the table, together with all mathematical sections of the book, should be based upon an unaccustomed system of notation. No doubt the work of conversion would have given the translator some trouble, but that would have been as nothing to the collective waste of time now imposed on readers.

The method of determining stresses in frames is specially valuable for the purpose of inquiring into the load capacity and stresses in existing cranes prior to the substitution of electrical driving or adaptation to other modern requirements.

Part VI. in a sense is supplementary to the preceding divisions. It describes and illustrates in an exhaustive manner by drawings and photographs examples of crane construction by leading makers in Germany, and gives full particulars of many noteworthy cranes built in Great Britain and the United States. As before mentioned, British practice is not illustrated quite so fully as could be desired, the deficiency of working drawings being the most conspicuous feature.

The preponderating feature of the book is very naturally the attention paid to the progress of crane building in Germany. We do not at all object to this, and feel sure that the evidence brought forward as to the thoroughness of German methods should do an immense amount of good to British engineers engaged in the design and construction of cranes. The inroad made by German cranes into English markets is a matter deserving consideration, and it is not at all reassuring to find German cranes of 100 tons and 150 tons installed in places like Glasgow, Sheffield, and Dublin. Such developments and the higher cost of British cranes in many cases point to the necessity of substituting for the empirical methods still prevailing among cranemakers in this country a more exact system of procedure by which material and labour might be saved and more satisfactory working performances obtained without sacrifice of practical strength and security.

NOTES.

Architectural Treatment of Ferro-Concrete Structure.

We may draw attention to an advertisement which appears under the head of "Competitions" in this issue, in which premiums are offered for the two best designs for the architectural treatment of a building constructed in ferro-concrete. We are not, we may say, anxious to see ferro-concrete extensively adopted in architectural structures; but it is probable that it will be adopted to a certain extent, and the possibility of its architectural treatment becomes therefore a question of the day. Some experiments of this kind have been made which have been for the most part very unsatisfactory: we hope this proposed competition may evolve something better. It will be seen that two eminent architects have kindly consented to act, along with the Editor, as jurors in awarding the premiums.

Architectural and Engineering Institutions.

In his presidential address to the Civil and Mechanical Engineers' Society on the opening of the Jubilee session of that body Mr. Twelvetrees referred to the fact that architects had always been eligible for membership in virtue of the close relations existing between engineering and the constructive side of architecture. Other recognition of the same tie is furnished by the constitution of the Austrian Society of Engineers and Architects, and was evidenced from 1852 to 1868 by the American Society of Civil Engineers and Architects, the forerunner of the association now confined to civil engineering. In the present day, when engineers alone cannot get on without two or three dozen varieties of institutions representing distinct branches of work, there is not much to be said for societies embracing members of two distinct, even though allied, professions. Still there are many directions in which mutual action might be taken with every advantage, as in the formation of joint committees or conferences to discuss matters of common interest. Mr. Twelvetrees propounded a scheme for bringing British engineers into closer touch by the formation of a union comprising representatives of all the chief engineering institutions, societies, and associations, and entitled to act with the combined authority of British engineering. If such a central body were formed, architectural institutions might well bring support either by conferring on subjects affecting both professions, or by following the example of Germany, where an effective union of engineering and architectural societies is an accomplished fact and has borne good fruit.

Clay in Cement Mortar.

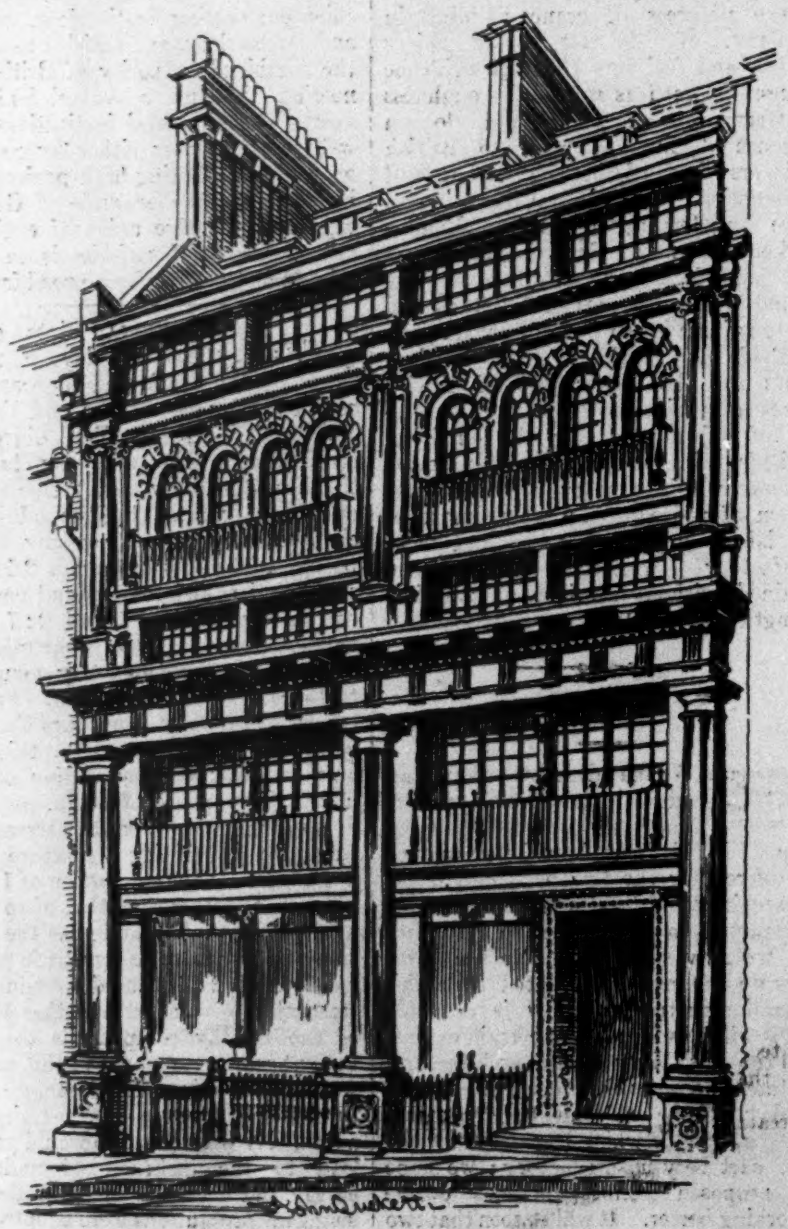
Additional data on the effect of clay in concrete are afforded by recent tests conducted by the Ulster and Delaware Railroad Company. The object was to determine the effect produced on the impermeability and tensile strength of cement mortar by the addition of clay. The clay was carefully selected, pulverised to pass through a 2,500-mesh sieve, and added to Portland cement in two mixtures of 1:7 and 2:7 respectively. Test briquettes were made with one part of cement and clay composition to three parts of sharp sand. From the results of the tests it appears that specimens of the mortar 8 in. thick were able to resist the percolation of water under the pressure of 40 lb. per square inch, that the tensile strength of briquettes containing a mixture of clay and cement in the proportion of 1:7 was somewhat greater than that of specimens made without clay, and that the admixture of clay with the cement in the proportion of 2:7 caused a reduction of strength. We understand that the idea of the railway company is to employ cement mortar prepared in this way as a watertight lining for concrete walls. In general practice the permission to admix clay with concrete would probably lead to the inclusion of undesirable earthy and vegetable matter unless very stringent precautions were adopted.

Breakdowns on Electric Railways.

THREE "Tube" railways, the District Railway, and an electric tramway system in Surrey were all stopped for two hours on Saturday afternoon owing to an accident in the power-station at Lots-road, Chelsea. The official report states that the cause was a "surge" of high-tension current causing the control switches to fuse. This is an extremely vague statement, and doubtless a fuller report will be issued later. It seems most extraordinary that any combination of circumstances could have rendered necessary the entire shutting down of the station. We should have thought that the current-carrying capacity of the control switches was so great as to make "fusing" a physical impossibility. It it is much more probable that "arcing" caused their destruction. We remember that five years ago an accident due to a high-power surge occurred on the Manhattan Railway in New York. The occurrences in the power-station were most alarming. At first brush discharges took place from the high-tension insulators. Then a short circuit took place in a manhole, the cover of which was blown to a considerable distance in the air. A high voltage spark caused one of the generators to short-circuit, and the entire system had to be stopped for a short time. The methods devised, however, by Steinmetz and others for preventing high-power surges have proved completely successful, and it would be interesting to know if these or similar devices are employed at the Chelsea station. A writer to the *Times* concludes that this accident proves that it would be very foolish to supply all London from a central power-station, seeing that a complete breakdown might possibly occur in a similar way. We think, on the other hand, that the substantial reduction in price that would ensue from centralising the supply would far more than compensate for the infinitesimal increase in the risk of a break in the continuity of the supply.

Electricity in Bulk.

AT the Middlesbrough meeting of the Iron and Steel Institute Mr. C. H. Merz read an interesting paper on electric power supply and its effects on the industries of the North of England. This paper is of special interest owing to the building of large power-stations in the neighbourhood of London in the immediate future. On the North East coast there are three large power companies whose aggregate output is nearly one quarter that of the total electricity generated in the whole of the public supply stations of the United Kingdom. The large electric power-station at Carville-on-the-Tyne has a greater output than any other station in Europe. The Tyne shipyards and engineering works have practically universally adopted electric power, and with the exception of the chemical factories, all the coal for power purposes is consumed at the supply station. There has consequently been a great reduction of smoke and a great saving in coal. The power companies also supply eighty miles of electrified railway, four tramway systems, and the lighting of towns aggregating 700,000 inhabitants. The cheap supply of power has started several new industries, in particular those connected with electro-chemistry. These industries already require a constant supply of 12,000-horse-power. The power companies are making arrangements with the owners of blast furnaces and coke ovens to utilise their waste heat for generating electricity. At the present time five waste heat stations are being constructed. The managers of the power companies are to be congratulated on their foresight in utilising so quickly the latest methods in electrical power generation.



New Premises, Norfolk Street, Strand.

New Office Premises, Norfolk-street, Strand.

WE give a sketch of a rather striking building which has lately been completed in Norfolk-street, Strand, from the designs of Mr. John Dunn, F.R.I.B.A. It will be seen that the elevation is of a somewhat unusual character, honestly acknowledging the trabeated principles of modern construction, though we question the wisdom of employing XVIIIth-century details in a building so foreign to the spirit of that age. The confined frontage has necessitated an unpleasant feature in the main Doric cornice, which has had to be returned at a less projection than the orthodox profile, giving it a cramped appearance, which is rather unfortunate. The shafts of the lower and upper orders are of polished red Peterhead granite, Portland stone being employed for the rest of the elevation. The pedestals of the lower order are sculptured with the insignia of the Duke of Norfolk, on whose property Norfolk-street stands. The stained glass employed in many places about the premises has been executed from cartoons prepared at Herald's College, representing various armorial bearings of the Howard family. The chief consideration in the design was to give as much light as possible, a result which has been attained with success. The construction throughout is fireproof, the roof being formed of Jarra wood filled in with coke breeze, a method which combines lightness with reasonable security against fire. The builders were Messrs. Thomas White & Son.

Some Old Shop-fronts in London.

AMONG the yet remaining old shop-fronts of London No. 225, Oxford-street is remarkable for its simple yet elegant elevation, one after a kind of which but few examples are now to be seen in London—having a central door between windows fitted with small panes and closed with shutters, and without the heavy overhanging facia of the later style. A very

similar example, earlier in date, and with rounded bays, has remained to our time at the tobacconists' shop, No. 34, Haymarket; we may mention also that at No. 25, Bryanston-street, Bryanston-square, and one in Brewer-street, at the corner of Lower James-street, Soho, of early XVIIIth-century date. The late XVIIth-century shop-front, on the east side of Macclesfield-street, disappeared during the demolition for the making of Shaftesbury-avenue, and that of Wishart's for the recent widening, on the south side, of Coventry-street. The shop-front at No. 107, Strand, was designed in a somewhat different manner, with carving, larger panes, and heavier woodwork. The premises, held from the Duchy of Lancaster until Michaelmas, 1914, at 560*l.* per annum, and extending to Little Savoy-hill in the rear, have been placed in the market, but will in all likelihood be pulled down ere long for the widening of the Strand.

Lecture by Mr. Bannister Fletcher on Renaissance Architecture.

ON Monday evening Mr. Bannister Fletcher, F.R.I.B.A., delivered at the University Buildings, South Kensington, the first of a series of twenty-four lectures on Renaissance Architecture, forming the third year's work of a University extension course in architecture. The lecturer pointed out in his preliminary remarks the importance of the study of architecture to non-professional students, more especially as no genuine progress in the art could be expected unless the public took some interest in it. Proceeding, he gave an interesting résumé of classical and mediæval architecture, illustrated by lantern slides. In the course of his lecture Mr. Bannister Fletcher said that the statement which has been advanced that the Renaissance proved the death-blow of architecture was not worth consideration. He further said that every movement in architecture was the result of gradual development, adducing in support a photograph of the Riccardi Palace to show that the Renaissance was but a development of the preceding styles along classic lines. This is very true of the Florentine phase, but by no means, in our opinion, applies to the culmination of the Renaissance at Rome, which has had the chief influence over the Europe styles. Mr. Fletcher well pointed out, as one of the distinguishing features of the modern styles, the intrusion of the personal element, unknown in the Middle Ages, a feature strongly brought out by Fergusson in his "History of Modern Architecture." The lectures should prove of great interest, as well to the professional student as to the non-professional audience for whom they are primarily intended.

Unemployment and the Special Army Reserve.

WE have, of course, nothing in these columns to do with military systems or policies, but it seems desirable, in the present crisis, to refer to the War Office circular as to the Special Reserve. Those who belong to the building and contracting trades are, as every one knows, by reason of climatic conditions, able to obtain much less work in winter than in summer. The Special Army Reserve therefore appears to afford an opportunity for young men out of work to obtain a comfortable living during the winter, and at the same time do a service to their country. Young men from seventeen to thirty years of age are eligible for the Special Reserve, and on joining it they will during the winter months pass through a course of six months' training. They will belong to the Reserve for six years, and in subsequent years will have an annual training of from fifteen to twenty-one days. As the men are fed, clothed, and housed, the pay can be saved, and at the end of the training a bounty of thirty shillings is payable. Any healthy young man, such as a bricklayer's labourer, who is now out of work, can therefore obtain employment in the Special Reserve, and it is to be hoped that employers will make the details in regard to this force as much known as possible. Unemployment is grievous, but there is a tendency among manual labourers to sit down and wait on Providence or the State for work, and even to refuse casual jobs if the rate of pay does not satisfy them. But we hope that wiser and more patriotic ideas will prevail in regard to the Special Reserve.

THE WOLVERHAMPTON COTTAGE EXHIBITION.

IT is now generally recognised that the housing of the less wealthy classes of the community should no longer be allowed to proceed along the haphazard lines which have been the rule in the past. To be herded together in monotonous streets of unattractive houses, packed as closely together as the exigencies of the estate (miscalled "developed" by the speculative builder) will allow, can be good neither for body nor soul. It is barely ten years ago since Ebenezer Howard published his book, "Garden Cities of To-morrow"; Bournville and Port Sunlight had already shown the feasibility of his proposals, and since that date the Garden City at Letchworth, and many similar projects throughout the kingdom, have shown that the demand for better housing is a very real one. The Fallings Park Estate, near Wolverhampton, of which only a small part has as yet been developed for the purposes of the present exhibition, is about 400 acres in extent. The owner, Sir R. A. S. Paget, Bart., recognising the desirability of preventing the erection of crowded rows of dwellings, has taken steps to secure its development on garden suburb lines. The site is about 470 ft. above Ordnance datum, and sufficiently far from the centre of the town to be well out of the smoke of its factories. Approximately 7 acres of land are being developed by the Fallings Park Garden Suburb Tenants, Ltd., composing the chief part of the exhibition site; and we may here call attention to the fact that the majority of the houses erected here are not merely for the purpose of exhibition, but the nucleus of a permanent garden suburb.

Fifty-seven houses have been entered for competition under the following classes:—

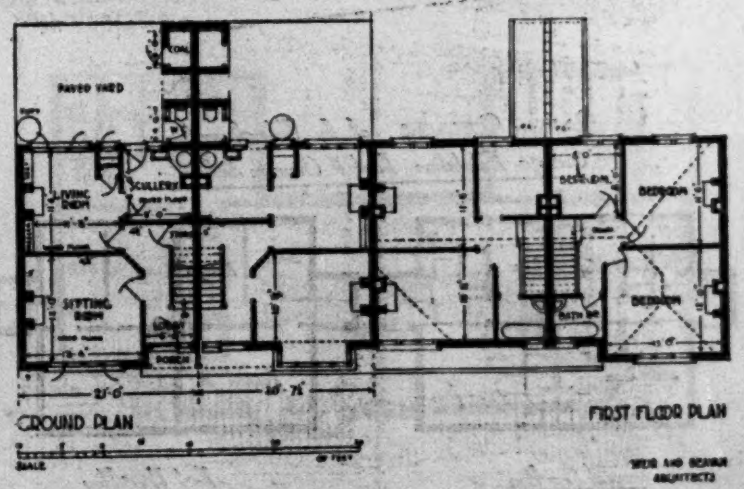
CLASS 1.—The best and most economical house erected either singly, in pairs, or in groups, up to eight in number, containing not less than three bedrooms, the cost not to exceed 200*l.*

CLASS 1A.—The best house under Class 1 in which the cost exceeds 200*l.*, but does not exceed 250*l.*

CLASS 2.—The best and most economical house suitable for erection in pairs or in groups, up to eight in number, as follows:—Containing living-room, scullery, and two bedrooms, the cost not to exceed 150*l.* per house.

CLASS 3.—The best detached or semi-detached house or houses, including bath-

GROVP of FOVR COTTAGES for the FALLINGS PARK TENANTS SOCIETY



A B B A

Nos. 18 & 21.

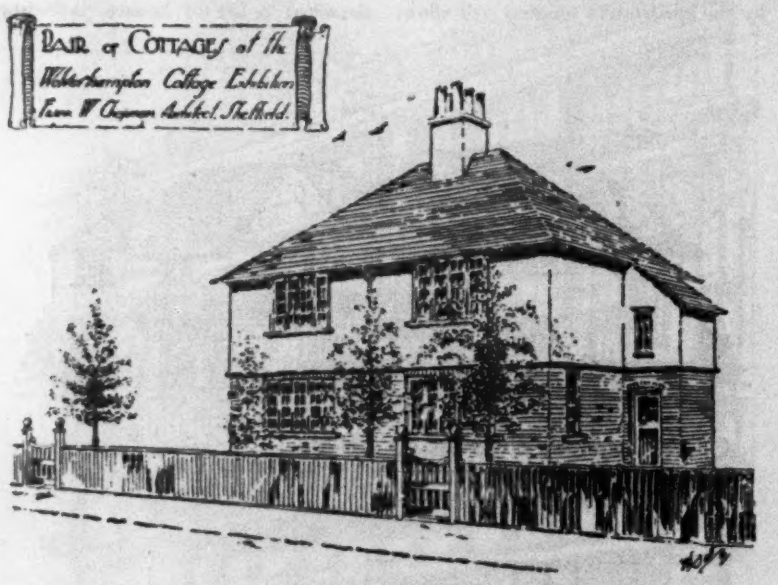
room, and not less than three bedrooms, the cost not to exceed 400*l.*

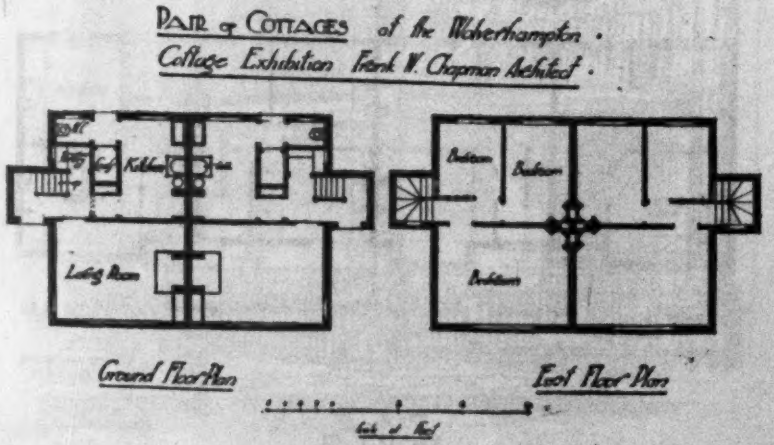
CLASS 4.—The best house, detached, semi-detached, or in a group up to eight in number, having not less than three bedrooms. No cost fixed, but this is taken into consideration in awarding the prizes.

Gold, silver, and bronze medals are to be awarded in each of the above classes. The cost in every case was to be inclusive of architect's fees, builders' profits, and all necessary connexions to sewers and to water and gas mains, but not including the price of the land. To quote from the very copious catalogue prepared by those in authority, "It has been found necessary to give more latitude in regard to prices—some of the houses entered as costing 150*l.* to 200*l.* have cost considerably in excess of these amounts. It is not proposed to disqualify these houses, but to award prizes under special classes." In point of fact not a single cottage has been erected for 150*l.* It is interesting, however, to note that the prices given are not mere estimates in advance, but have been arrived at after completion. To meet the discrepancy between the actual cost of erection and the original estimates one additional class, Class 2A, has been added. The judging took place on October 2, and we trust to give the results as soon as possible.

In a previous article we have dealt with the general lay-out of the Fallings Park estate. We may therefore proceed at once to our examination of the cottages in detail. Arriving from Wolverhampton, and keeping to the right along Victoria-road, the first cottages seen are Nos. 1 to 7, a block of seven dwellings from the designs of Mr. A. Randall Wells. They are of two classes, Class 1A and Class 2A respectively, those of the larger type being placed in pairs, while the smaller type are arranged alternately. This, as is claimed, is undoubtedly an economical arrangement, besides giving variety to the elevations. The larger type contain sitting-room, dining-room, kitchen and scullery combined, three bedrooms, with bathroom and water-closet combined. Referring back to the requirements of Class 1A, the only stipulation made is that there should be not less than three bedrooms. Here we find that a dining-room has been provided for, which we consider quite unnecessary, more especially as the room would be quite untenable as a sitting-room after meals by reason of the kitchen opening directly into it. In our opinion it would have been better to put a kitchener into it and made a living-room and kitchen out of it, reserving the present kitchen solely for scullery purposes. The class who would most probably be the occupiers of a house of this kind prefer, as a rule, to make their kitchen a living-room, and thus save all possible labour in the preparation of meals. If the intention was to make this a dwelling suitable to a class of people who would keep a general servant the proximity of the kitchen is certainly calculated to save labour, but is otherwise objectionable. Besides a water-closet on the ground floor a combined bathroom and water-closet—always an objectionable arrangement—is provided on the chamber floor, as we have stated above. The cost of these houses is stated as approximately 250*l.* It may not be out of place to remark here that the prices quoted do not include the cost of papering in any cases, though including everything concerned with the structures. The three smaller types, Class 2A, costing 170*l.* each, have the same combined bathroom and water-closet; in this case with the very grave additional disadvantage of being the only convenience, none being arranged for on the ground floor. The coal store opens directly into the kitchen, another point to which exception might be taken. The best plan is to make this give directly into an open lobby, as is done in other examples erected here. The external and party walls are of 9-in. brick, limewashed on the outside with hydraulic lime. The kitchen, larder, and porches are paved with red quarries. The elevations are pleasing and not too extravagant in design. Nos. 8 and 9, 16 and 17 were designed by Mr. W. J. Oliver. Most of the objectionable features which exist in the examples we have just mentioned are here avoided. The accommodation comprises parlour, living-room (where the cooking would be done chiefly), scullery, bathroom, and three bedrooms. Coals and water-closet are contained in a back addition on the ground floor, opening into the yard. These houses are entered under Class 3, and their cost is 275*l.* apiece. The principal elevations have some pretension to a "Letchworth" character, but the pose is quite given up at the back. Nos. 10 to 15 are by the same architect, and exhibit the same qualities of common sense, though here, as in the former, it might perhaps have been an improvement to make the pantry open into the living-room or scullery, as might have been done without any change of plan. Four of this block come under Class 1, and their cost is stated as 185*l.* each, while those at either extremity are entered under Class 1A, costing 240*l.* The increased cost is due to slightly larger dimensions, there being in both classes the same number of rooms, viz., parlour, living-room, scullery, and three bedrooms. No provision is made for a bathroom, and we think wisely, as much space is saved by the instalment in the scullery of one of the many forms of suitable baths now on the market. The walls are of 9-in. brick, rough-casted above ground-floor sills, and limewashed. Nos. 18 to 21 were designed by Messrs. Speir & Bevan, and have been entered under Class 1A. They are shown in course of erection, and appear to be soundly and strongly constructed. When completed, as the illustration shows, the outside walls, of 9-in. brick, will be rough-casted above the ground-floor sills. The elevations are good and suitable. The cost of Nos. 18 and 21 is given as 230*l.* each; of Nos. 19 and 20 as 220*l.* A glance at the plan will show that the general arrangement is excellent. All the cottages we have mentioned hitherto have been built by the Fallings Park Garden Suburbs Tenants, Ltd. Proceeding across Bushbury-road, along Thorneycroft-lane, Nos. 315 to 318B are next seen. This is a block of six cottages, nearly similar to those by the same architect, Mr. C. M. Crickmer, which gained the first prize at Letchworth in 1907.

The following variations have been made in the plan: Four parlour cottages have been erected instead of two, and the two centre cottages have a living-room only, as at Letchworth. A corridor has been added to each of the parlour cottages, reducing the size of the parlours, but giving separate access from the front-door to the kitchen. These are entered as Class 1A, their cost being 220*l.* Their accommodation consists of kitchen, parlour, scullery (or rather space for a copper), and three bedrooms, with coal store and water-closet. The rooms are very fair-sized, and should make a convenient home. Nos. 317 and 318 come under Class 1, the price stated being 180*l.* The elevations are simple and suitable. The builders were Messrs. Cave & Sons, of Wolverhampton. Nos. 320 and 321, designed by Messrs. Boswell & Tomlins, show a good plan, the coals and water-closet being efficiently disconnected from the rooms used for habitation. There are three bedrooms, a bath-room, sitting-room, living-room, and scullery. The elevations have a pretentious, suburban villa air which is very unpleasant. The materials are 9-in. pressed brick, with rough stucco facings above first-floor level. Their





Nos. 322 and 323.

cost is 230*l.* apiece, and they are entered under Class 1A. The builder was Mr. Arthur Griffiths, of Wolverhampton. Nos. 322 and 323, of which we give an illustration, were designed by Mr. F. W. Chapman, and gained a prize at Sheffield. Retracing our steps, and turning to the left along Bushbury-road, the first pair of cottages reached are Nos. 309 and 310, the design of Mr. F. T. Beck. As they have been built for the Elkay Bath Company certain allowances must be made for a plan which is no doubt suited to the display of this firm's excellent productions, but singularly unsuited to the requirements of decorum and convenience. We do not wish to be harsh, but we are sure that the architect himself, whose taste and ability are beyond question, would be the first to admit that a combined bathroom and water-closet, giving directly on to the hall, exactly opposite the sitting-room door, is neither convenient nor desirable. Their cost is 280*l.* apiece, economical enough, considering the accommodation—four bedrooms, sitting-room, scullery, kitchen, and bath-room. The elevation is admirable, avoiding, as the architect claims, extreme features. They have been entered under Class 3. No. 308, of the same class, by Mr. T. H. Bickley, which has been erected for 270*l.*, we can find little fault with. There is a fair-sized sitting-room, kitchen, scullery, and three bed-rooms, with water-closet and coal store, well situated with regard to convenience of access and sanitary requirements. The builder was Mr. F. Tompkinson, of Wolverhampton. Nos. 305 and 306, the architects of which were Messrs. Benton & Roberts, compare very favourably with anything else on the grounds, and we are not surprised that they took the first prize at the Sheffield Cottage Exhibition. The elevations, however, are dull and spiritless. We would call attention to the external 11-in. cavity walls, the most weatherproof method of building a thin wall, and one of the few examples of its use at Fallings Park. They are included in Class 1A. The cost was 235*l.* apiece. Their builder was Mr. F. Beard, of Wolverhampton. For compactness of plan and suitability of elevation it would be hard to beat Nos. 303 and 304, the design of Mr. A. W. Worrall, their cost amounting to 240*l.* each. They were built by Messrs. Cave & Son, of Wolverhampton, and are placed in Class 1A. The remaining cottages are situated along the Cannock-road, which bends to the left from the point where our survey commenced. Exigencies of space compel us to treat more briefly of them than their merits deserve. Nos. 89 and 90 (Class 1), similar to Nos. 22 and 23, were designed by Messrs. Pepler & Allen, and cost 240*l.* each. Nos. 85 to 88 are similar in all respects to Nos. 18 to 21, only in that instance they are shown completed.

Nos. 77 to 82, by Mr. Basil Stallybrass, of which two are in Class 3, two in Class 2A, and two in Class 1, costing respectively 240*l.*, 160*l.*, and 190*l.*, are perhaps the most striking in appearance at the exhibition. The plans are very compact, and, indeed, admirable in their simplicity. A doubtful feature in the houses at either extremity of the block is the bringing of the stairs directly into the scullery. The builders were the Fallings Park Garden Suburb Tenants, Ltd. There remain now to be noticed Nos. 92 to 92*z*, Class 3, whose design is due to Mr. W. Pearson. The plan is very good; the elevations are poor to a degree; why so large a bay-window to the bathroom? The builder was Mr. J. T. Biggs, of Netherton, and the cost of erection was 280*l.* The accommodation comprises parlour, living-room, scullery, three bedrooms, and bath-room, with coal-store and water-closet contained in an outbuilding.

We have not room to mention the designs which are also on exhibition, and for which medals and diplomas will be awarded; prizes will also be given for building materials of various kinds.

In conclusion we would congratulate the citizens of Wolverhampton on the solution of the housing problem offered at Fallings Park.

The judges of the Exhibition concluded their inspection of the houses on Saturday the 3rd inst. The following are their awards:—

CLASS 1A.—House containing three bedrooms, cost not to exceed 250*l.*

Gold Medal: Nos. 89 and 90. Messrs. Pepler & Allen, architects (Croydon): Fallings Park Garden Suburb Tenants, Ltd., builders.
Silver Medal: Nos. 303 and 304. A. W. Worrall, architect (Wolverhampton): Cave & Son, builders (Wolverhampton).
Highly Commended: Nos. 322 and 323. Frank Chapman, architect (Sheffield): Reeves Charlesworth, builder (Sheffield).
Nos. 79 and 80. Basil Stallybrass, architect (Liverpool): Fallings Park Garden Suburb Tenants, Ltd., builders.
Commended: Nos. 305 and 306. Benton & Roberts, architects (Sheffield): F. W. Beard, builder (Heath Town).

CLASS 1.—House containing three bedrooms, cost not exceeding 200*l.*

Gold Medal: Nos. 11, 12, 13, and 14. W. J. Oliver, architect (Wolverhampton): Fallings Park Garden Suburb Tenants, Ltd., builders.
Silver Medal: Nos. 317 and 318. C. M. Crickmer, architect (London): Cave & Son, builders (Wolverhampton).

CLASS 2A.

Gold Medal: Nos. 1, 4, and 7. A. R. Wells, architect (Hastings): Fallings Park Garden Suburb Tenant, Ltd., builders.
Nos. 78 and 81. Basil Stallybrass, architect (Liverpool): Fallings Park Garden Suburb Tenants, Ltd., builders.

CLASS 3.—Best house costing from 250*l.* to 400*l.* No first prize.
Silver Medals: Nos. 8, 9, 16, and 17. W. J. Oliver, architect: Fallings Park Garden Suburb Tenants, Ltd., builders.
Nos. 309 and 310. F. T. Beck, architect (Wolverhampton): Cave & Son, builders.
Nos. 77 and 82. Basil Stallybrass, architect: Fallings Park Garden Suburb Tenants, Ltd., builders.

CLASS 4.—Best house in exhibition.

Gold Medal and 20l.: Pepler & Allen, architects (Croydon): Fallings Park Garden Suburbs Tenants, Ltd., builders.

CLASS 5.—Special class for general excellence of design of back elevations.

Bronze Medals: Randall Wells, architect. Basil Stallybrass, architect.

CLASS 6.—Best design of houses to be erected containing not less than three bedrooms, and at a cost not to exceed 200*l.*
First Prize: Robert Bennett and Wilson Bidwell (Letchworth).
Second Prize: W. J. Oliver (Wolverhampton).

CLASS 7.—Best design of house containing two bedrooms, and not to exceed 150*l.*
First Prize: A. W. Worrall (Wolverhampton).
Second Prize: Leonard W. Tracey (Birmingham).

CLASS 8.—Best design of house containing not less than three bedrooms, to be erected at a cost not exceeding 400*l.*
First Prize: Geoffry Lucas (London).
Second Prize: H. L. Paterston (Sheffield).
Third Prize: Geoffry Lucas (London).

We give an illustration of the Silver Medal design in Class 1A, which has been forwarded to us by the secretary. The illustration of the Gold Medal design in that class we have not yet received.

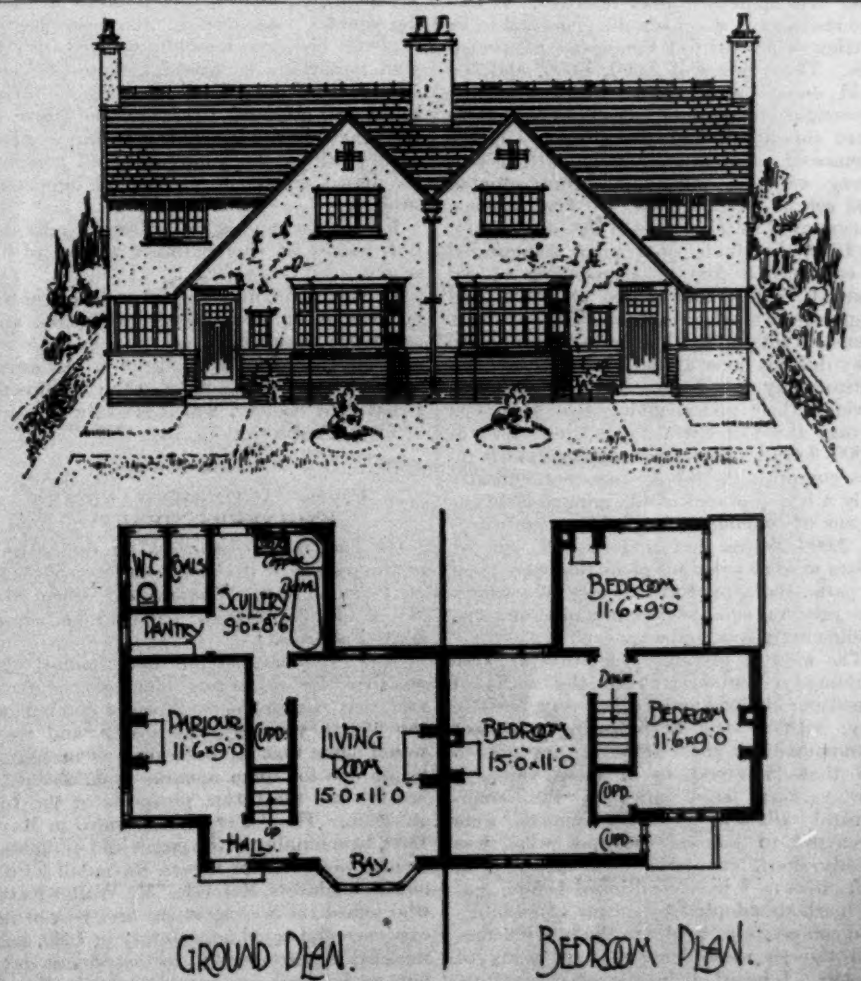
LIVERPOOL ARCHITECTURAL SOCIETY:

PRESIDENT'S ADDRESS.

THE first portion of the opening address given by Mr. Eccles, as President of the Liverpool Architectural Society, on Monday, was occupied with a description of the proceedings at the Vienna Congress of Architects last year, which we can hardly give space for, in view of the fact that we published a long Report of the Congress at the time occupying twenty-seven columns of our issues of May 30 and June 6.

After referring to the Vienna street improvements Mr. Eccles proceeded to consider the suggestions which they afforded for improvements in Liverpool:—

"Now I would refer briefly to the Liverpool Town Planning Bill, and how to my mind the idea of the Ringstrasse is being adapted to the requirements of Liverpool under very difficult circumstances. I think it is hardly publicly recognised that our Corporation intend to make Liverpool a city second to none in this country, under this new Act which we hope will soon become law. Of course, the development of the old part of Liverpool is a matter of time and circumstances, but the Corporation are dealing with the



Design awarded Silver Medal in Class 1A.

New Liverpool outside this with no uncertain hand. The Act briefly will give them powers to do the following :—

1. The Corporation may compel owners to continue existing thoroughfares to comply with the plan laid out for this continuation.
2. They may require any new street which will form a main thoroughfare to be 80 ft. wide.
3. The Corporation may purchase over and above 80 ft. at the average price of the land before development as much more land as they may consider necessary for the widening of that street.
4. The Bill insists that houses shall be set back to a distance equal to one-tenth the width of the street at the least.
5. No new street exceeding 150 yds. in length shall be laid out without a cross street.
6. The Corporation will have the power to mutually arrange with estate owners for the acquisition of open areas for parks and playgrounds, etc.

One is bound to realise the superiority of the laying out of cities like Vienna, Munich, Cologne, Frankfort, etc. How are they able in these foreign cities to deal with existing poor conditions and improve them? The following description will explain the method :—

The earliest of the important European cities to adopt the "Ring" as a means of connecting the radial thoroughfares was Vienna, and in 1857, as a result of considerable popular agitation, the Emperor Francis Joseph issued a decree addressed to the Minister of the Interior requiring that "the enlargement of the inner City of Vienna for the purpose of its suitable connexion with the suburbs should be undertaken as speedily as possible." The improvements dealt rather with the enlargement of the inner city and with its connexion with the suburbs than with a remodelling of the district itself, which was then mainly occupied with the fortification and ditch and a wide space beyond. The fortification and ditch still surround the heart of the city, though the buildings had long grown beyond, and it was suggested that these should be removed and at the same time adequate provision be made for a new opera-house, museums, and galleries, and other of the more important public buildings. It was decided to open a competition of plans for the improvement, the jury to consist of a commission of officials who represented various interests. Before the final award was made the plans had to be further submitted to a Committee of specialists. Three prizes of 2,000, 1,000, and 500 gold ducats were to be awarded to the successful competitors. Eighty-five designs were submitted, and though none of the premiated plans was literally carried out, many valuable suggestions were adopted and set the standard for the final scheme. Encouraged by the success of the competition, in 1892, the Municipality again inaugurated a competition for the remodelling of old Central Vienna, and invited architects and engineers from all parts of the world to submit plans. Profiting by their former experience, they did not hope to find amongst the competitors any one design, and they therefore divided their prizes, giving two of 10,000 florins, three of 5,000 florins, and three of 3,000 florins. For "part designs which do not comprise the whole city, but consider only a few questions of the improvement, or means of communication," there were prizes of 3,000 florins and under; and, finally, prizes were awarded for plans that were good in parts, though not satisfactory as a whole. The jury was composed mainly of Professors, leading architects, and engineers.

The idea of private speculation in large buildings is subservient to the spirit of benefiting the community in every possible way, with a view to procuring a perfect harmonious scheme. Now, it appears to me that it would be of great value to our various large cities if the architectural advisors of the Councils were permitted to see on the spot what was already done, or was in contemplation in such cities as I have mentioned before, and the methods adopted by means of architectural competitions to obtain the best schemes even though these schemes took years to develop. I heard a distinguished architect concisely sum matters up in saying that London, broadly speaking, spent its money on motor-cars and modern luxury, and did not care a jot what sort of surroundings they were placed in.

Turning again to our own city, last year the President mentioned the possibility of the Corporation obtaining powers to allow the construction of reinforced concrete buildings without being brought under the stringent regulations of the Building Act. I am glad to say that the Corporation has now powers to relax this Act of Parliament as to the thickness of walls, on complete plans and elevations being furnished showing all constructional steelwork carrying weights. The Corporation also have powers regarding dilapidated and neglected structures (in addition to dangerous ones) to apply to the Court for an order to call upon the owners to put the property into a fit state of repair or pull it down. Also the Corporation can control the manner of demolishing buildings. I would wish that the Corporation had similar powers to deal with the ever-increasing noises in our streets and sirens on our river. Also I would like to suggest, to relieve the streets of the cartage of heavy goods, that the system of tunnelling, as carried out in Chicago for conveyance of freight, should be seriously considered by the authorities. This wonderful system of tunnels in Chicago is 60 miles in extent, and is carried out by the Illinois Tunnel Company, and an exceedingly interesting article on the subject is to be found in a paper called *The American Business Man*, of April, 1908, showing how the system works. The large warehouses and stores are able to tap these subways by elevators which can deliver on every floor. If such a scheme were adopted in Liverpool we should not see horses hauling huge lorries up steep and slippery gradients with such difficulty.

I hear from Professor Reilly that the Royal Institute of British Architects have under consideration the granting to students of the University exemption from the final as well as the intermediate examinations.

There is an appreciative article in last week's *Builder* on the Liverpool School of Architecture, and I am pleased to note the special reference to the necessity of students being occasionally set to work to plan important buildings, monuments, and laying out of streets and open spaces. This last I feel strongly about, as the future of the improvement in our large cities is going to depend on the younger school grasping the broad treatment of this all important subject.

I desire to express to Professor Reilly my best wishes for the continued success of his school.

In conclusion, may I plead on behalf of the necessitous brethren of our profession, and ask those members of our Society who are also members of the Institute to subscribe to the best of their ability to the Architects' Benevolent Society, which is sadly in want of further subscriptions."

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

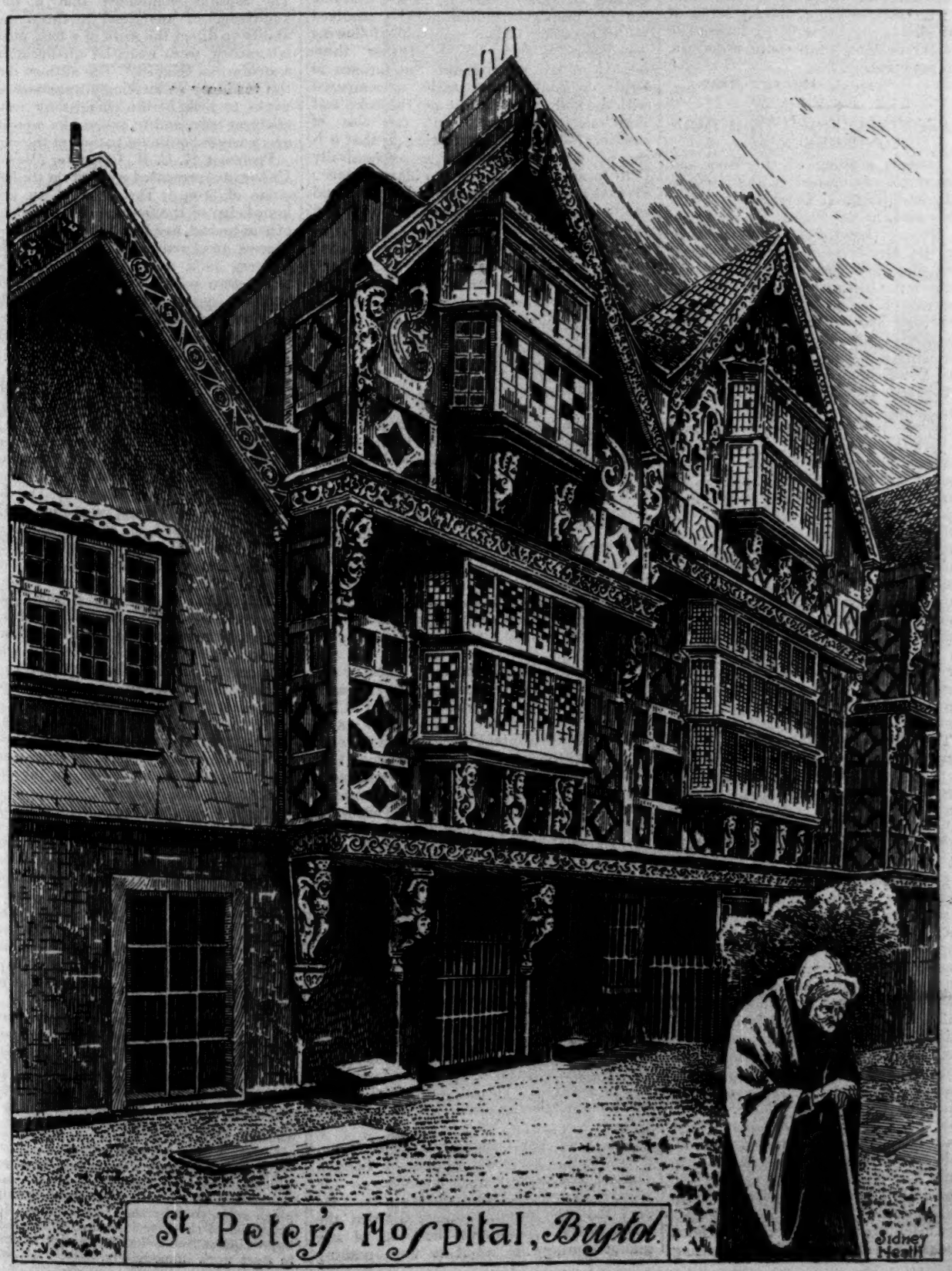
ON Thursday in last week the first sitting of the session of the above Society was held at Caxton Hall, Westminster, when Mr. W. Noble Twelvetrees delivered his presidential address.

The President, having first thanked the members for re-electing him to the office, said that that night the Society entered on the fiftieth year of its existence, and they would agree that the occasion was an appropriate one for some remarks upon the past history and the future prospects of the Institution. The Society was founded in May, 1859, by a number of the pupils and draughtsmen at the works of Messrs. Ravenhill & Co., marine engineers, Ratcliffe. Mr. Walter Rutt, who joined the Society in the first year of its existence and acted as secretary in 1860, had retained his membership to the present day, but as he held an appointment in South Australia naturally he was an infrequent attendant at the meetings. The President proceeded to trace the history of the Society step by step, and mentioned amongst other matters the amalgamation with the Young Engineers' Scientific Association in 1861, the various members who had preceded him in the Chair and who had acted as secretary, and the different changes of address. Since 1898 Mr. A. S. E. Ackermann had occupied the position of secretary, and to his untiring efforts the existing prosperity was largely due. The next subjects for attention were the objects of the Society and the manner in which these were attained. The primary aim of the Society as defined by the founders was "the discussion of scientific subjects, especially those connected with engineering." By the rules members should be "men engaged in the engineering profession or kindred pursuits." The last three words had generally been interpreted so as to admit architects to membership. There was ample justification for such a union of engineering and architecture. The two professions were virtually identical so far as concerned purely structural work, and in modern practice the architect who was able to design an important building in all its details must possess engineering knowledge of no mean order. Whether architects as a general rule had time to study during their period of training both the artistic and the constructive branches of building design was a matter very much open to discussion. His personal feeling was that, notwithstanding the valuable work done by bodies such as the Royal Institute of British Architects in furthering theoretical knowledge of construction, the modern architect would find it an increasingly difficult matter to qualify himself as a combination expert in masonry, steel and reinforced concrete construction, and in the design and installation of steam, boiler, engine and pumping plant, gas and oil engine plant, electric and hydraulic lifts and hoisting appliances, electric light and power systems, heating and ventilating systems, water supply and drainage systems, and the varied mechanical appliances which entered into the equipment of large modern buildings. At the same time it was an undoubted fact that many architects possessed sound knowledge of constructive work, and those who had a leaning in that direction were admitted to the Society, where they could discuss scientific subjects with engineers in pursuance of the policy they had adopted, and which had been followed by the Austrian Society of Engineers and Architects since the year 1848. The papers read at their meetings during the past half-century had covered every department of engineering work; some having been contributed by engineers of wide experience and others by young engineers. In each case the educational value had been great, although differing in kind. To hear papers by admitted experts was a privilege for those at the commencement of their professional career, but it was a still greater privilege for young men to hear such contributions at a comparatively small meeting where they did not feel debarred from taking part in discussion or in asking for information on points not clear to them. Their membership had never been large, for in no period of its career had the Society attempted rivalry with the Institution of Civil Engineers, or with institutions, societies, and associations specially representing individual branches of engineering practice. The whole question of amalgamation with the Society of Engineers had been discussed at length by a joint Committee under the chairmanship of Professor Henry Adams, with the result that a definite scheme of amalgamation was now before the respective Councils of the two bodies for consideration. The proposals made due provision for recognising the status and honourable career of their Society. As the matter was still *sub judice* he would not enter into details, but he took the opportunity of stating that the union of the two societies could not fail to be of mutual benefit. Having dealt with

the past history of the Society of Engineers, the President turned to some of the representative engineering institutions of the United Kingdom, the Continent, and America. Foremost amongst these was the Institution of Civil Engineers, although in point of seniority the first place must be given to the Smeatonian Society of Civil Engineers, founded in 1771, and still surviving in a form which was rather in the nature of a social club than a scientific institution. If the membership of all the engineering institutions and societies and all local engineering bodies and all engineering societies attached to universities and colleges were combined it was probable that the total membership would not fall far short of 50,000 corporate members, associates, and students. So enormous had been the development of engineering that, in spite of the enlightened views entertained by the Institution of Civil Engineers as to the wider scope of the profession and the welcome accorded to engineers of every class, that admirable organisation of which they were all justifiably proud did not represent British engineering as a whole. The claims of those engaged in constructional works, which, for want of a better designation, were once generally, and were still to some extent, distinguished as belonging to "civil" engineering, naturally demanded so large a share of attention that members chiefly concerned in mechanical, electrical, and other branches of work were virtually compelled to ally themselves with departmental institutions and societies. He could not refrain from expressing the hope that something might be done in the near future to inaugurate a movement for bringing all engineering bodies into closer union with each other, and with the Institution of Civil Engineers. It occurred to him that a practical scheme would be to establish a union comprising representatives of all professional engineering institutions, societies, and associations.

ST. PETER'S HOSPITAL, BRISTOL.

THIS is one of the most interesting specimens of ancient domestic architecture remaining in Bristol. The original mansion is thought to have been erected about the end of the XIIth century by John Norton, in the possession of whose family it remained for several centuries. After a varied and chequered career it was sold in 1602 to Robert Aldworth, a wealthy merchant, whose monogram appears on the building, together with the date 1612. This gentleman



seems to have rebuilt the house, for in a contemporary deed it is described as having been "by the said Robert Aldworth erected and new built." The frontage with gables and arabesque enrichment is of this (1612) date, but a small portion of the churchyard frontage towards the east may well be part of the original house of the Nortons. After being occupied by various families as a residence it was in use in 1654 as a sugar house, being mentioned as such by Evelyn; and from 1696 till 1698 it was used as a mint. Finally, at the last-named date, it passed into the hands of the present owners, then known as the Corporation of the Poor, when the beautiful Jacobean sitting-room, fitted up by Aldworth, was adopted by the guardians for their meetings, and has served them continuously in that capacity since 1698. It is a noble apartment, with a plaster ceiling divided into square and diamond compartments filled with floral and other devices; the cornice has a running series of armorial shields supported by griffins. The open timber roof, of XVth century date, is in good preservation.

SIDNEY HEATH.

IRON AND STEEL INSTITUTE AUTUMN CONFERENCE.

THE autumn meeting of the Iron and Steel Institute was opened in the Victoria Hall, Middlesbrough, on Tuesday, Sir Hugh Bell, President, in the chair.

The Mayor (Lieut.-Colonel Poole), in offering the members a cordial welcome, reminded them that Middlesbrough was the birthplace of the Institute, and was primarily the creation of the great railway system. Middlesbrough had no existence as a port or town prior to 1830, but now, thanks to the improvement in the river by the Tees Commissions, Middlesbrough took the sixth place among the 130 ports in the Kingdom, and was the most important port in the world for the export of iron and steel. In the early days of the port the average size of the vessels was 96 tons; to-day it was between 6,000 and 7,000 tons; and Middlesbrough had become the centre of the largest iron and steel-producing district in the world.

Sir Hugh Bell, having acknowledged the reception given to the Institute, announced that his successor would be Sir William Thomas Lewis, of Cardiff, who had been nominated to fill the office of President for the ensuing two years from next May.

The progress of the iron and steel industries of the Cleveland district during the last quarter of a century, since the previous meeting of the Institute in Middlesbrough in 1883, was sketched in a paper by Mr. W. Hawdon, of Middlesbrough.

Mr. T. C. Hutchinson (Skinningrove Iron Company, Carlin How, Yorkshire) followed with a paper on the mechanical cleaning of iron ores. The field of economy, he said, in blast furnace practice, and in the utilisation of by-products from the blast furnace had been so successfully cultivated that an abundant harvest had been reaped by the utilisation of the gas in gas-engines either for blowing purposes or for the production of electric energy; and by the direct treatment of the hot metal immediately after it flowed from the tapping-hole, either in steel furnaces or for foundry castings. It was now suggested that further economy would follow if more attention was paid to a careful selection of material charged into the blast furnace. At the Skinningrove ironworks for ten years (1895 to 1905) the supply of ironstone was all obtained from one mine. Since 1905 part of the ironstone smelted had been obtained from the company's Boulby Mine. Fairly constant conditions of blast pressure and temperature had been maintained, and all material other than ironstone had been uniform. The impurities sent out of the mine had been the variable quantity. From 1895 to September, 1901, the ironstone was smelted as delivered from the mine without any mechanical cleaning. The increasing consumption of materials per ton of iron produced was a matter of great concern to the management, and steps were taken to ascertain the cause. It was found that the increase and variation of impurities agreed exactly with the increased and varying consumption of materials in the furnace and the cost of smelting operations. The management then determined to adopt some mechanical method of cleaning out the shale and other impurities from the bulk. Resort was had to a form of cleaning-belt similar in principle to that adopted at neighbouring ironstone mines. The belt was put to work in October, 1901, with the result that the consumption of minerals per ton of pig-iron fell from 107·102 cwts. as for the year 1900, to 102·92 cwts. At the present date about 13 per cent. of impurities were mechanically removed from the ore by the cleaning-belt. After years of careful observation and comparison of costs of smelting ores containing varying proportions of impurities admixed to the ironstone, he had come to the following conclusions:—"(1) That, whether these impurities are charged into the furnace in larger or smaller percentages as compared with the main bed of ironstone, the coke and limestone requirements and the cost of smelting increase in exact ratio; (2) that it is cheaper to pick out impurities mechanically than to melt them out in the blast furnace; (3) that mechanical cleaning is desirable, and can be applied to all descriptions of ores used in the manufacture of pig-iron.

At Wednesday's meeting the interest mainly centred in a paper by Mr. C. H. Mory, of London, describing the remarkable effect of electrical power supply on the industries of the north-east coast. (1) In a great saving of coal and reduction of smoke; while (2) the application of electricity to all new uses has been facilitated. The suburban traffic facilities of Newcastle were more ample than those of any other town of similar size at home or abroad. Four new rolling mills were about to be driven electrically. (3) New industries had been established in the district purely because of the cheap power supply available. (4) A substantial commencement had been made in the utilisation of the waste heat and gases existing in the area, and in this regard the district occupied a unique position owing to the extent to which its future power requirements could be met by electricity produced as a by-product of two of its largest industries, the making of pig-iron and the making of coke.

At the Thursday meeting a paper on Gas-Producer Practice was read by Messrs. W. A. Bone (Leeds University), and R. V. Wheeler (Normanton). The authors stated that it was their intention to demonstrate by appeal to the results of experiments how with low steam saturation temperatures a most effective combination of rapid rate of gasification with high thermal efficiency could be continuously maintained over long periods of time under ordinary works conditions, furnishing a rich gas of high carbonic oxide content, and eminently adapted for either power or heating purposes. The lowering of the steam saturation from 60° to 55° reduced the carbon dioxide in the gas by 0·7, and increased the carbon monoxide by 0·8 per cent., without appreciably affecting the hydrogen content. The further lowering of the steam saturation in later trials from 55° to 50° reduced the carbon dioxide in the gas from 4·4 to 2·5 per cent., and the hydrogen from 15·45 to 12·35 per cent., but increased the amount of carbon monoxide from 28·1 to 30·6 per cent. The gas was now of almost ideal quality for furnace as well as for power purpose.

Mr. H. E. Armstrong (Professor of Chemistry in the City and Guilds of London Central Institution) read a paper on the scientific control of fuel consumption. He said that the country calmly allowed the unrestricted export and the staff of our manufacturing life as if it were nothing more than a mere stone, without realising that we were parting with our heritage at a small fraction of the potential value. The public might content itself with the belief that science would discover a substitute for coal, and, therefore, feel no compunction in recklessly destroying the capital won from the sun in ages past. But science could give no support to the illusion, and was in duty bound to preach prudence to the world. If the consumption of fuel in works was to be the subject of scientific control in order that economies might be affected, it would be necessary to secure the services of a special class of chemists, qualified to study the problems which the consumption of fuel afforded.

A paper on the chemical control of the basic open hearth process of steel-making was read by Messrs. A. Harrison, of Warrington, and Dr. Vernon Wheeler, of Normanton. The authors contended that a thorough knowledge of analytical methods and the ability to direct the work of a busy analytical laboratory were essential qualifications for a steelworks chemist. The authors deplored the tendency so strikingly apparent in steel works to look to the chemist for results of analyses only, and to assign him a position in every way subordinate to that of the engineer.

Professor H. C. H. Carpenter (Mansherley University) presented a paper on the freezing-point of iron. The need of an accurate knowledge of the freezing or solidifying point of iron, he said, had been felt since the Bessemer process rendered possible the manufacture of very mild steel some fifty years ago. The determination of this physical constant, however, presented difficulties which had only been gradually met, and which were not satisfactorily overcome until the science of pyrometry had been placed on a firm foundation. Three scales were in use in the determination of high temperatures—(1) the gas scale; (2) the thermo-electric scale; (3) the optical scale. The gas scale was based on the expansion of gases, and more particularly nitrogen, with rise of temperature. It was the oldest scale of the three, and was available up to about 1,200° C. The thermo-electric scale was based on the use of thermo couples composed of the platinum metals and their alloys. Between 400° and 1,200° C. temperatures calculated by this formula agreed with those on the gas scale very exactly. But above 1,200° C. there was now considerable doubt as to whether this ephemeral relation held good, and from here onward there was no universally accepted temperature scale. The optical, the most recent scale of the three, was based on the determination of high temperatures by radiation methods. Professor Carpenter's conclusion was that in the present state of pyrometric science the freezing-point of iron was best defined either on the thermo-electric or the optical scale.

Mr. E. Demille Campbell (Michigan) read a paper on the constitution of carbon steels. There did not, he said, seem any inherent reason why the complete substitution of hydrogen by iron should prevent carbon atoms from assuming relations to each other similar to those which they hold in hydrocarbons. The conception of the carbon compounds of iron as metallic derivations of hydrocarbons suggested a possible explanation of many unsolved problems in the metallurgy of steel as for instance, how other elements too small in amount in themselves to profoundly affect the properties of the steel might enter into the carbon compounds, and, by altering their constitution, bring about effects on the steel as a whole entirely out of proportion to the amount of the element present.

PROPOSED HOSPITAL EXTENSION, ABERDEEN.—The Public Health Committee of the Aberdeen Town Council, at a special meeting, adopted plans submitted by the City Architect for the extension of the City Hospital. The estimated approximate cost is 10,400*l.*, and it is proposed to start work immediately.

DESIGNS FOR STAINED GLASS WINDOWS.

THESE designs represent two alternative treatments for a staircase for a house in Westmoreland.

The upper design represents the legend of "The Luck of Eden-Hall" as treated in a poem by J. H. Wiffen; on the left the magic cup is presented to King Oberon; in the centre panel is the adventurous knight who has carried it off, and in the righthand compartment presents it to the mother of the heir of Edenhall, with the caution that if the goblet break or fall, the luck of Edenhall is gone. Longfellow's poem, describing the catastrophe which followed the wanton breaking of the goblet by the lord of Edenhall, in a fit of bravado, is probably familiar to everyone.

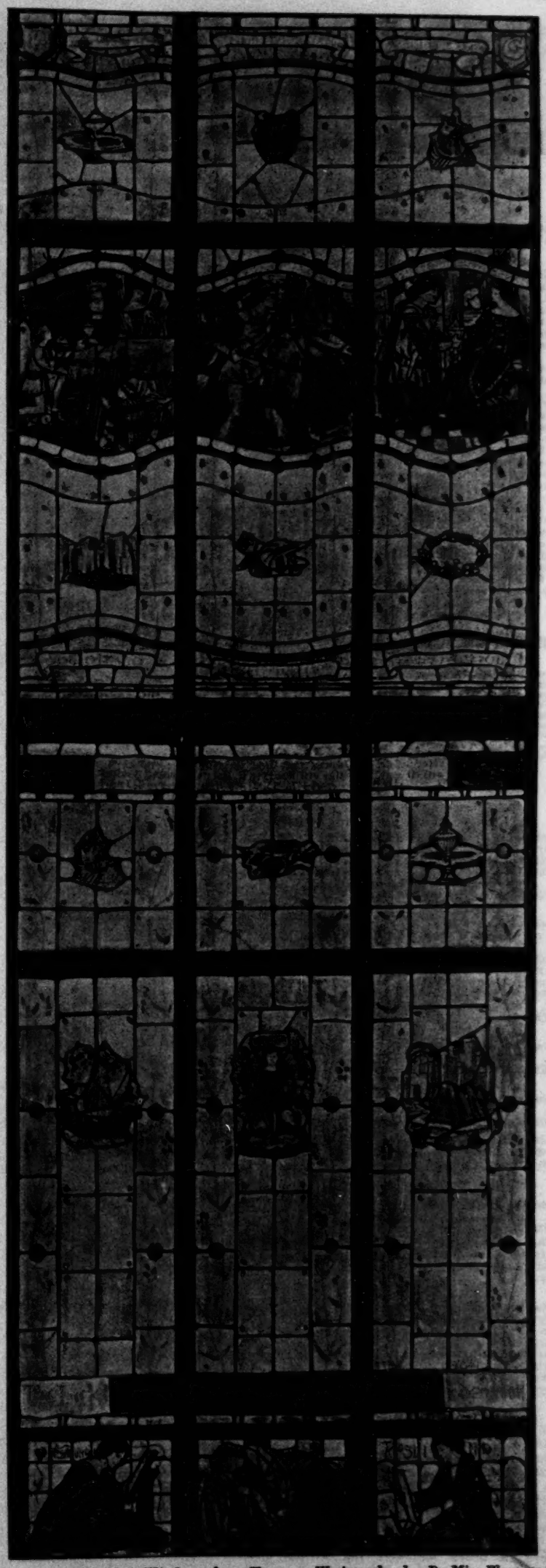
The other design depicts, in the lower panels, Fair Rosamund, Desdemona, and Rosalind.

The designs are by Miss Florence Camm, of Smethwick (Birmingham). The drawing was exhibited at the Royal Academy.

HAIR CRACKS IN REINFORCED CONCRETE BEAMS.

SINCE the existence of minute and uniformly distributed cracks on the tension side of a reinforced concrete beam under load has been generally admitted, we have heard the suggestion from time to time that cracks of the kind may favour corrosion of the embedded steel. The opinion of experts is that the effect of such tiny cracks is quite negligible, a view confirmed by a series of tests recently concluded in Germany. Thirty-two beams under loads which involved stresses in the reinforcement between 18,000 lb. and 44,000 lb. per square inch were tested for corrosion by enclosing the middle third of each member in a casing of sheet-iron, leaving a space into which was discharged a mixture of oxygen, carbon dioxide, and water vapour, thus providing all the elements necessary for rapid oxidisation. Most of the beams were kept in this corrosive atmosphere for three days, and the concrete was then stripped off for examination of the reinforcement. It is stated that in the case of twenty-seven beams where the stresses in the steel ranged from 18,000 lb. to 35,000 lb. per square inch, no trace of corrosion was perceptible, but that in beams where the steel had been stress to from 35,000 lb. to 44,000 lb. per square inch traces of corrosion were found. Although not absolutely conclusive, these tests suggest the extreme improbability of corrosion in the reinforcement of beams where tension is kept within the customary limit of 15,000 lb. or 16,000 lb. per square inch. More prolonged tests of similar character would set the question finally at rest. The investigation would not be very costly, and we should like to see it undertaken in this country, which ought not to be continually dependent on other nations for practical data.

BOARD SCHOOL, KIRKCALDY.—A new school has been erected by the Dysart School Board in Loughborough-road, Kirkcaldy. The school, which is a one-story building, has a total length of some 220 ft. Besides ten ordinary classrooms provision is made for cookery and laundry work, and there are also chemistry and physics laboratories with dark-rooms, and a manual room for manual instruction. A central hall, measuring 66 ft. by 30 ft., with corridors to the side wings of the building, is a prominent feature. On the front of the building the wall is relieved by some sculptor work by Mr. A. Murdoch, Kirkcaldy. The school was built to plans prepared by Mr. D. Forbes Smith, architect, Kirkcaldy, and the following are the contractors:—Mason, Mr. David Wallace, Pathhead; joiners, Messrs. Bogie & Nicol, Kirkcaldy; plumber, Mr. James Robb, Dysart; plasterer, Mr. Alexander Hutcheson, Kirkcaldy; slater, Mr. William Currie; tile work, Messrs. Field & Allan, Edinburgh; glazier, Messrs. Dickson & Walker, Edinburgh; smith work, Mr. James Lessels, Dunfermline; heating, Messrs. Chas. Ritchie & Co., Edinburgh; furniture, Bonnet Furnishing Company, Glasgow.



Designs for Stained Glass Windows for a House Westmoreland. By Miss Florence Camm.

THE BUILDER

OCTOBER 10, 1908.

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MEETINGS.

FRIDAY, OCTOBER 9.

Architectural Association.—Annual General Meeting. Address by the President (Mr. Walter Cave) and distribution of prizes. 7.30 p.m.

Royal Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. J. Steegmann on "Elementary Science—Physics, Chemistry."—I. 7 p.m.

MONDAY, OCTOBER 12.

Incorporated Clerk of Works' Association.—Mr. Quinton Simmons on "Modern Methods of Tile Manufacture." 8 p.m.

University of London (South Kensington, S.W.).—Mr. Banister Fletcher on "A Comparison of Gothic and Renaissance Architecture." 8 p.m.

Royal Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. J. Steegmann on "Elementary Science—Physics, Chemistry."—II. 7 p.m.

TUESDAY, OCTOBER 13.

Royal Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. J. Steegmann on "Elementary Science—Physics, Chemistry."—III. 7 p.m.

WEDNESDAY, OCTOBER 14.

Royal Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. J. Steegmann on "Elementary Science—Physics, Chemistry."—IV. 7 p.m.

Junior Institution of Engineers.—Visit to Messrs. Siebe, Gorman & Co.'s Submarine Engineering and Diving Apparatus Works, Westminster Bridge-road, S.E. 7 p.m.

FRIDAY, OCTOBER 16.

Royal Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. J. Steegmann on "Elementary Science—Physics, Chemistry."—V. 7 p.m.

Institution of Mechanical Engineers.—Mr. James Edward Darbishire on "Repairs, Renewals, Deterioration, and Depreciation of Workshop Plant and Machinery." 8 p.m.

SATURDAY, OCTOBER 17.

Royal Sanitary Institute.—Provincial Sessional Meeting at the City Council Chamber, Guildhall, York, at 11 a.m., Discussion on "The Architecture and Sanitation of Elementary School Buildings." Visits to one or two of the newest Elementary Schools in the City; and the York Waterworks at Acomb Landing, where the Jewell System of Filtration will be demonstrated by Mr. W. H. Humphreys, Manager.

STREET WIDENING IN SOUTHWARK.—For a long time past the Southwark Borough Council have been considering the desirability of endeavouring to effect a widening of East-street at its junction with the Walworth-road, but owing to the price asked for the property nothing has been done in the matter. It has now been referred to a committee to report on what buildings or parts of buildings it is necessary to acquire in order to effect the desired improvement.

Illustrations.

RESIDENCES, 11-14, HOBART-PLACE.

THESE houses are built on a site said to have been originally used as a hunting-box by King Charles II. The projecting house, No. 13, is occupied on the ground floor by Messrs. Geo. Trollope & Sons' estate offices. The upper part of this house, and Nos. 11 and 12, have been designed for private residences.

The elevations are carried out in a Georgian style with special selected Luton brown bricks and Portland stone, and the roof is covered in the front with Westmorland green slates. Several fine old sculptured marble chimneypieces have been fitted in the houses. The builders are Messrs. Geo. Trollope & Sons and Colls & Sons. Messrs. Boehmer & Gibbs are the architects.

COMPETITION DESIGN FOR TRANSVAAL UNIVERSITY COLLEGE.

THIS is a meritorious piece of architectural grouping in the Classic style, the *motif* of which is sufficiently indicated by the block plan in the corner. The author is Mr. Ernest J. Wellman, an English architect practising at Johannesburg.

The drawing was exhibited at the Royal Academy last year.

CHAPEL, ELTHAM COLLEGE (AS ORIGINALLY PROPOSED).

THIS is the exterior and interior view of the design for a chapel for Eltham College as originally proposed by the architect, Mr. Edwin T. Hall.

Unfortunately the building as here designed remained only on paper, a more simple building having been carried out in its place.

DECORATIVE PAINTING: "JACOB AND THE ANGEL."

A DECORATIVE figure design by Mr. R. Wallwork, a student at the Royal College of Art, for which a prize was awarded.

It is a powerful design in its main lines; but we may point out that, according to the usual canon of proportion of the figure, the head of the angel is too small.

MONUMENTAL DESIGN BY ALFRED STEVENS.

A DRAWING of an exceedingly fine model by Alfred Stevens for a memorial of the 1851 Exhibition.

The drawing is by Mr. J. S. Vickers, another Royal College of Art student.

THE LEICESTER GALLERIES.

THE exhibtion of designs by Mr. Arthur Rackham in illustration of the "Midsummer Night's Dream" fully realises the anticipations which we already expressed as to its interest and beauty. In this fairyland Mr. Rackham's genius is in its element. The very first drawing, "A Fairy Song," is fascinating in its beauty and delicate fancy—look especially at the head of the figure in the right-hand corner; and humour and imagination characterise the whole collection. "'Tis almost Fairy Time" is most poetically illustrated by the drawing of the interior of a bedroom with the curtained bed, the child asleep in the cradle (the only human figure seen), and the elves peeping in at the door. The figure of Bottom with the ass's head, after his comrades have fled in affright, is almost pathetic in its stupidity and bewilderment. The fairy drawings are full of delightful fancy, and the conception of Puck in No. 4 and others is probably the best that art has produced.

In the adjoining room is a collection of water-colours of subjects chiefly architectural, from Tunis and Kairouan, by Mr. Graham Petrie, executed in a broad water-colour style and with a great deal of admirable colour effect.

THE SUPERVISION OF MASONRY.

BY A CLERK OF WORKS.

MANY modern specifications demand that the stone to be used in the building shall be worked on the site, or in the builder's yard close by, and such a clause admits of better supervision than if the stone is dressed at the quarry—too far off for the clerk of works to pay many visits, or perhaps any at all, affording no opportunities of examining the stone in the block or even on the banker; whereas if worked on the site, or even in the builder's yard (if near at hand), each and every piece can be inspected, and no attempts can then be made by means of the shellac bottle and stonedust to hide flaws, errors, or other objections. It is questionable whether a clerk of works, or the architect for that matter, could insist on the stone being worked at the building, etc., if no specific mention of this condition appears in the specification, as it is cheaper under certain circumstances for the builder to have it dressed at the quarry—if he is paying carriage, for instance, as the weight of the waste stone of conversion has not to be accounted for; and another advantage may be that the quarry people have better and more advantages of working it than the contractor may have; but with competent masons, banker hands, etc., and facilities at his stoneyard for handling the stone, the builder ought to be able to turn it out nearly if not equally as cheap as the quarry firm, with the advantage that the work is inspected as it proceeds, which avoids the possibility of the quarry-worked stone being rejected on arrival by the clerk of works and consequent delay in waiting for replacement and delay generally means loss to the builder and annoyance to the architect or owner. Another advantage of working the blocks on the site is that the many unavoidable points raised when the work is in hand, and which will crop up no matter how carefully the architect prepares his drawing, can be settled immediately by a personal consultation of foreman mason and clerk of works, often with a result that would be unobtainable by any amount of correspondence on the subject.

The clerk of works, if he has no prior knowledge of the particular stone specified for his building, is well repaid by a visit to the quarry, even if some distance away, as he can obtain at first hand information about it—its possibilities, peculiarities and properties, especially if he could adopt two guises—going one day as a builder looking for a stone for cheap building, and on another as an architect or his assistant seeking a suitable stone for some proposed work. It is doubtful if he would hear the same account on both occasions, and if he poses in his true character as a clerk of works the quarry people may be very reticent in what they say.

The quarry may be specified; if so, well and good—the architect then possibly has a knowledge of the quality of the stone turned out; but if the builder is allowed to select the individual quarry, the clerk of works will call upon him to submit samples. Probably, beyond the face stonework and the steps and landings, the approval of the stone for the other parts of the building will be left to the clerk of works. The technical education of this official should enable him to deal with any samples submitted; he will look for stains, veins, and blotches, and generally such signs as betoken non-uniformity in chemical composition, and this last, as also the porosity and density of the stone, will be factors for approval, as on these to a large extent depend the durability and strength of the stone in question. The C.W. (clerk of works) will know that of two samples of the same stone the one which absorbs the least will probably weather the best. With samples approved at an early stage the building work can proceed.

Stone when worked and delivered to the site needs careful attention prior to fixing, as it is a costly material, and replacement

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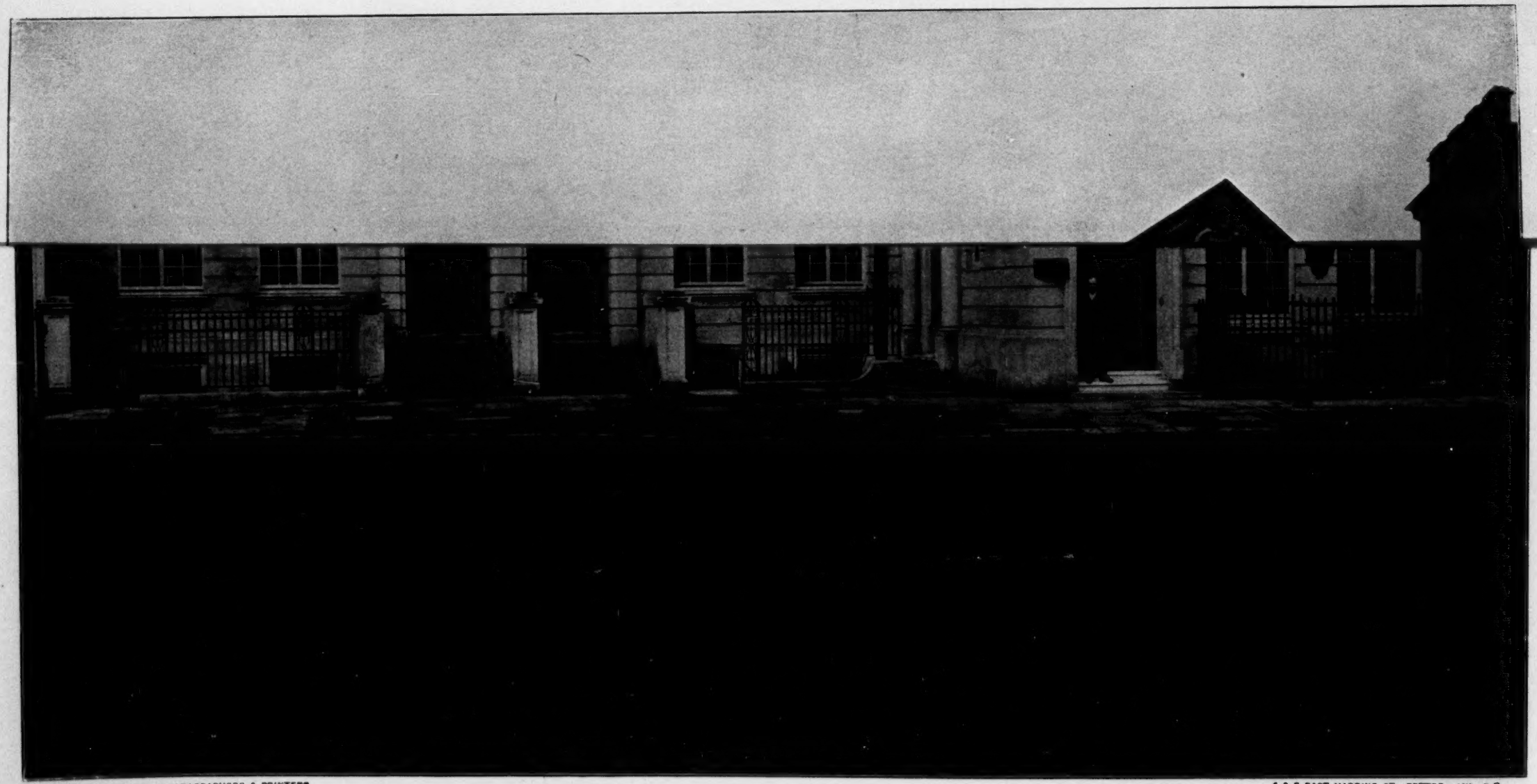

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RESIDENCE, HOBART PLACE, S.W.—Messrs. Boehmer & Gibbs, Architects.

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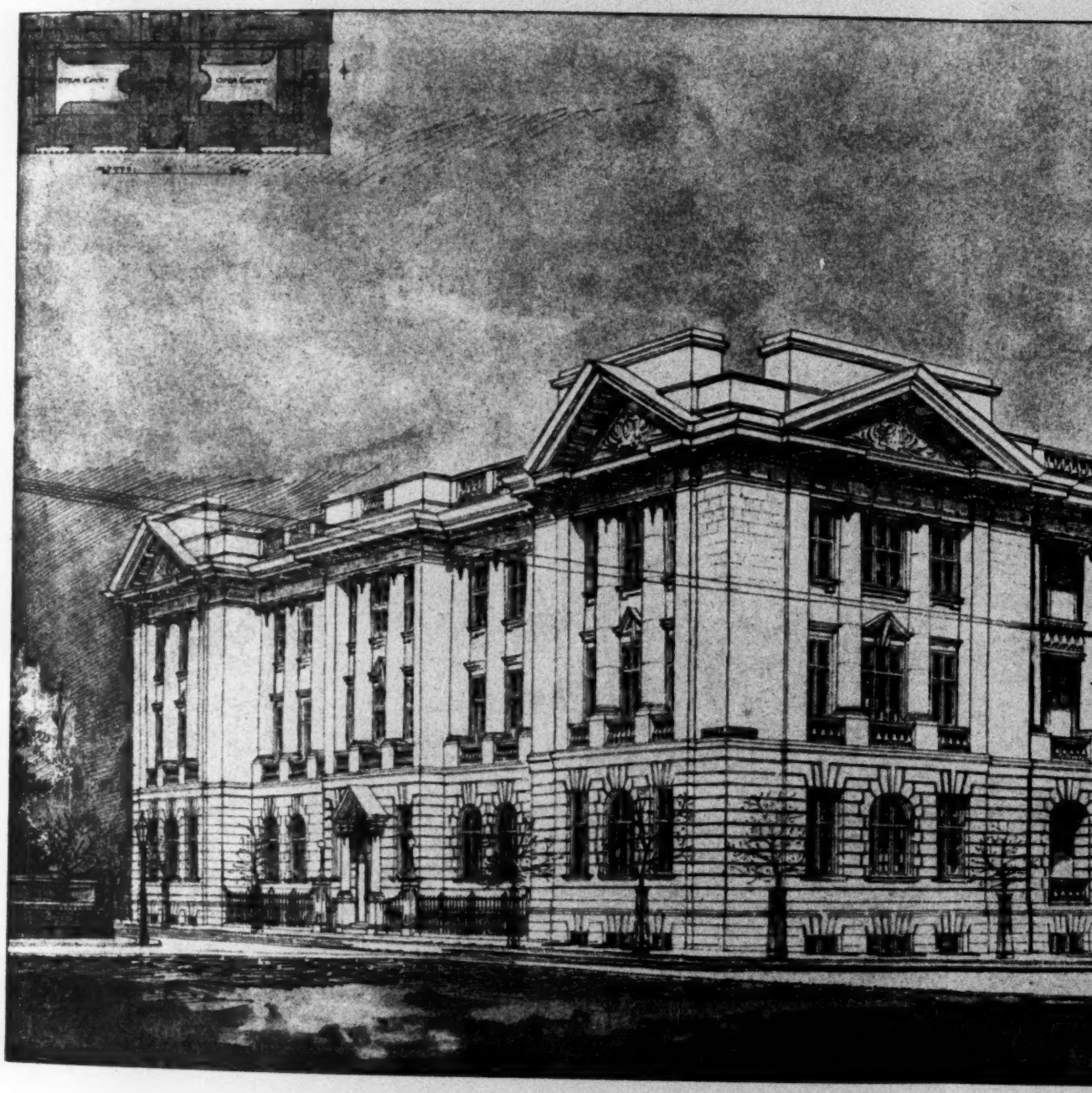

COMPETITION DESIGN FOR TRANSVA

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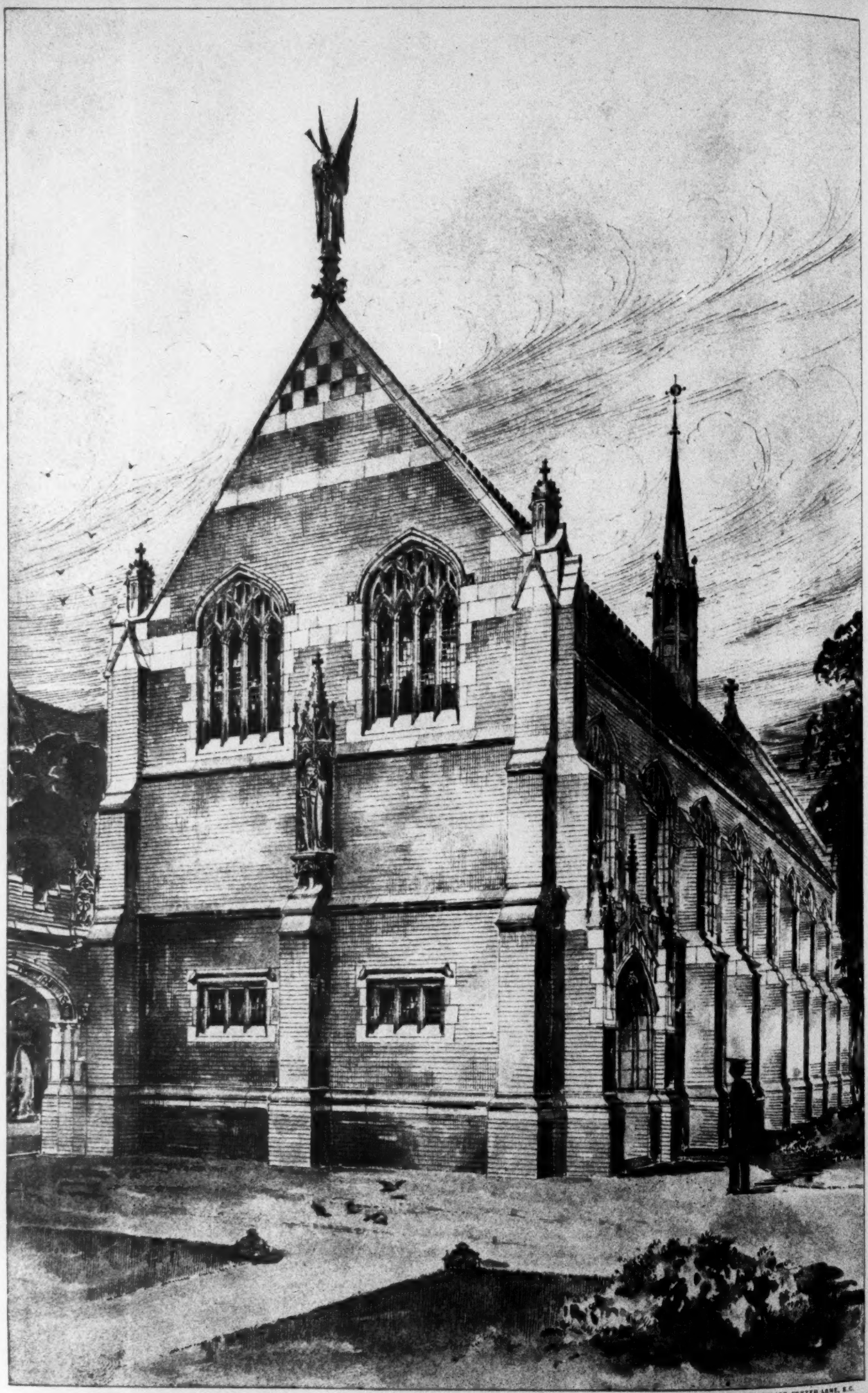

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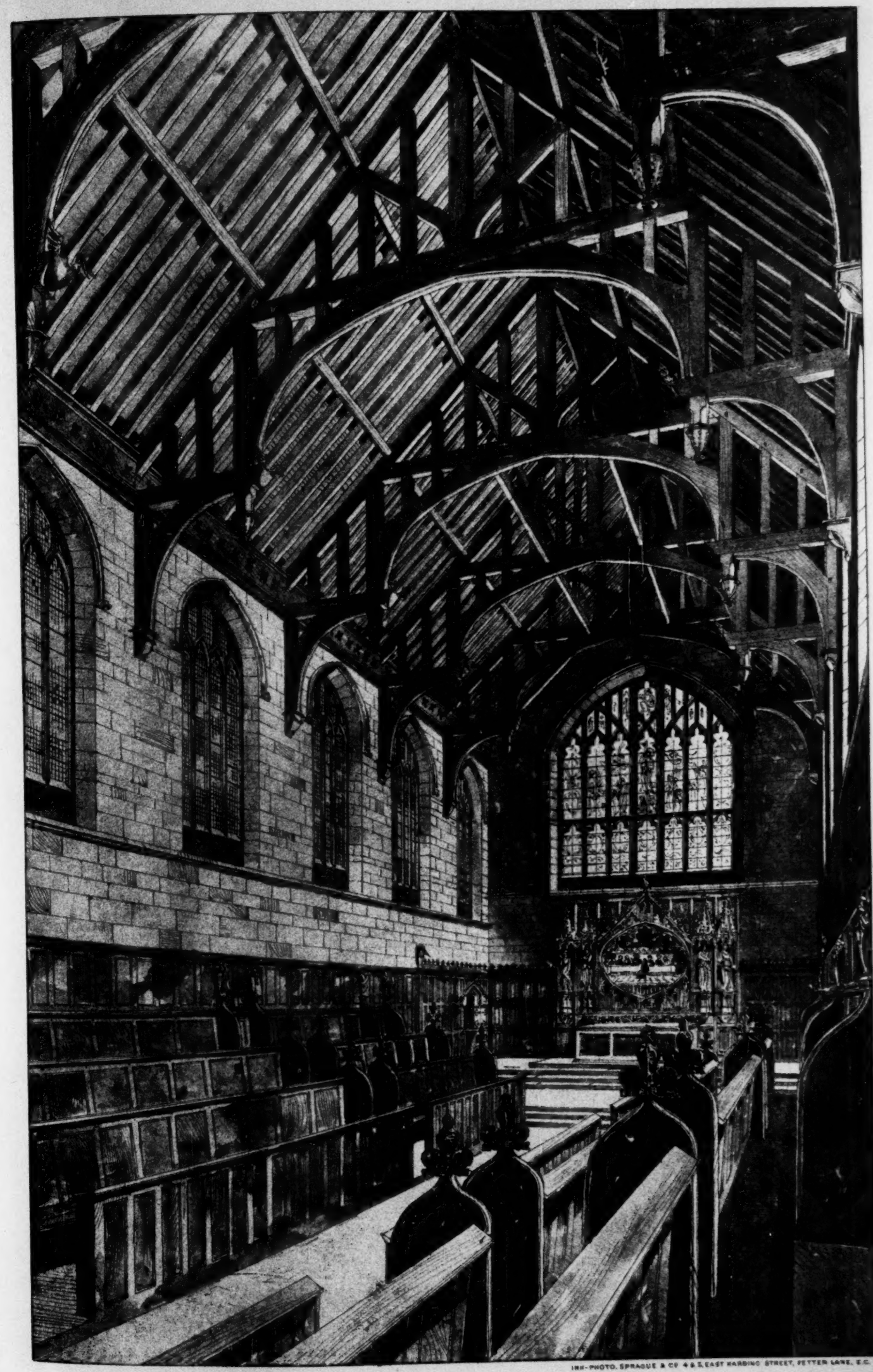

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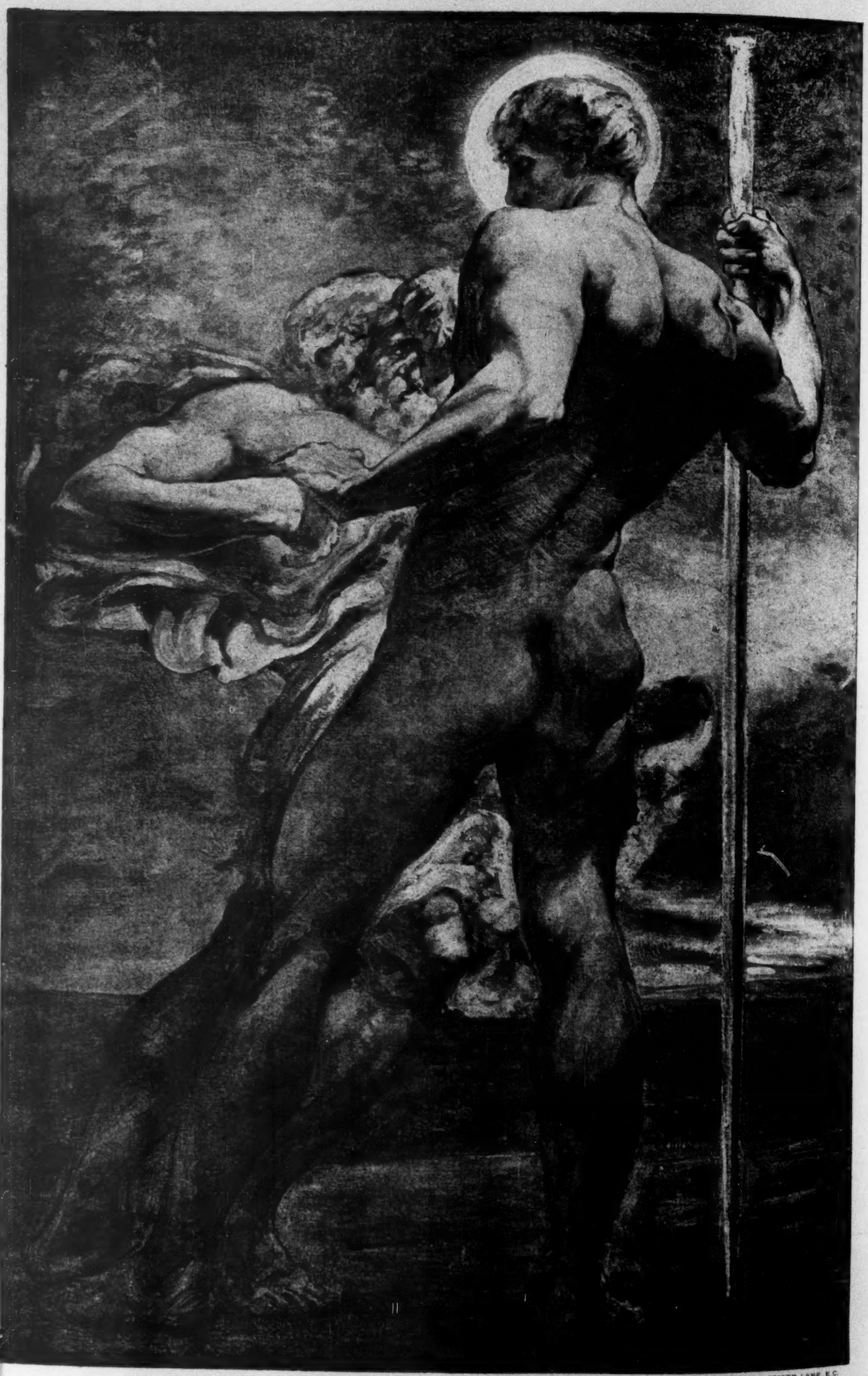
CHAPEL, ELTHAM COLLEGE (AS ORIGINALLY PROPOSED).—Mr. Edwin T. Hall, F.R.I.B.A., Architect.



"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DECORATIVE PAINTING: "JACOB AND THE ANGEL."—By Mr. Richard Wallwork.

Royal College of Art, 1908

"INK-PHOTO" SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DESIGN BY ALFRED STEVENS.—From a Drawing by Mr. J. S. Vickers.

Royal College of Art, 1907.

of broken blocks entails both expense and delay. It should be stored in such a position that nothing can fall on it—as bricks from a scaffold; it should be protected from the weather (wet and winds), as the last will blow particles of dust and grit against the face which are apt to damage it; and it should be stored in some sequence to the fixing plan, so that it has not to be moved from the time of delivery until its time for fixing arrives, so as to avoid damage by several handlings, and, if space for storage permits, no stone must be placed on another, and perhaps it is unnecessary to mention that at unloading or storing no block must be stood on its worked face.

When worked stone is delivered it should be ready for fixing, *i.e.*, the face exposed in the building should be finished—rubbed, etc., as the case may be (carving excepted, as in that case the stone would be left bosted ready for the carver only). It is the practice of some stone merchants to smear over the face of the stone a slurry of moistened stone dust, which custom does not admit of the foreman or the clerk of works examining the stone at the time of its delivery, with the result that cracks, stopping, chipped corners, and arrises are not noticed until some later period, by which time the merchant has a signed delivery note, and is therefore well able to suggest or hint anyway that the damage has happened since delivery. The dressed stone should, therefore, be consigned to the works clean from the banker, etc.

Although the clerk of works has no *locus standi* in the matter of when the stone is to be delivered, it is part of his duty to urge the works on, and he can therefore suggest to the builder or his foreman improvements, if he finds that the stones are arriving irregularly. It is not an unheard-of occurrence for a (say) third floor block to arrive with others that are for use lower down, but this the foreman can prevent by insisting that the stones shall be delivered in proper sequence. The C.W. will have been consulted as to the bonding of the blocks, their length, and depth on bed, etc., and the blocks can be numbered accordingly, all to one template bearing a similar number. It will be necessary to see that no stone is too long, and the jointing should be symmetrical. In the case of columns, pillars, etc., a visit to the quarry will have shown the C.W. the greatest height these can have—to be in one stone, set on their natural bed. If over that height, or if specified, joints must be put in.

It is important that the natural bed of the stone should be observed—*i.e.*, the bed they originally occupied in the quarry. This in a quarry is not always horizontal as subsequent upheaval may have made that bed recline at an angle. When stone is so placed in a building it has a greater resistance to compression, but also if a stone is built in a face wall with the natural bed vertical it is apt to peel off in layers, particularly so if the stone is of a laminated nature. There are exceptions to this rule, as in cornices or overhanging portions, or in richly ornamental or undercut work, where the natural bed is placed vertically, but in the case of the two former instances a sheet-lead protective covering should also be provided securely kept in position by lead dots. It would be as well here whilst dealing with cornices to mention that the clerk of works should notice that the large cornices are sufficiently tailed into the wall to carry their overhanging weight; it is best perhaps that they extend throughout the entire thickness of the wall, and in some instances it is necessary to hold them down by means of rolled steel joists and anchor bolts.

The examination of the stones as finished ready for hoisting and setting will occupy a large proportion of the time of the clerk of works. The more important points to look to are that the beds and joints are truly worked, the arrises are exact and square, and the face accurately and truly worked. As regards the bed, it is no uncommon thing to find that this has not been worked square, or to find that the square you try it up with touches only at the edge—*i.e.*, that the centre has been worked hollow, so that all the weight when set will be thrown on the edges, with the result that these will splinter or crumble off, leaving a very unsightly joint on the face, which no mason can fake up to present so good an appearance as the truly worked stone would have done. With joints similar trueness of work is essential, as if one stone has these correct and in another stone they are out of plumb the two stones when put together will give a wide or open joint at the top or bottom, and probably be stone and stone at the opposite end—both of which are objectionable. The arrises must be square, which will naturally result if beds, joints, and face have been accurately worked. Nothing looks so bad as arrises that do not carry a line stone with stone. The face of the stone needs careful supervision, too—the man in the street will have a chance of criticising this; it must be free from varieties of colours, stopping, etc., and the finishing must be well executed—*e.g.*, that by rubbing a true plane face results, and not a series of hollows and ridges; it must also be out of winding.

The chief points needing close attention in the hoisting and setting of the stone are that proper hoisting tackle is employed—and used properly; that lewis holes for them are neatly cut in, which must never be put in a portion of the stone that is not covered by the bed of the stone above; that each stone is bedded throughout its entire bed, and not merely at the edges leaving the middle hollow or void; that when set it is plumb on the face; that quoins and arrises cut in and show straight lines; that equal projections on projecting courses are obtained; that no cement or other mortar is allowed to remain on the face of the stone to stain same, but that all is removed as soon as possible; that iron for dowels, cramps, etc., is not used, but that slate, copper, or lead only are employed, to prevent unsightly stains, etc., and that wherever necessary these are put in. As in everything else, there is a right and a wrong way of cutting a hole for the lewis, and the C.W. will observe that the correct one only is made, *i.e.*, that the whole side of the lewis presses against the side of the cutting and not only at the outer edge of the hole. The clerk of works will also take notice that no grooves, throatings, etc., are omitted to be worked on before fixing; it is more difficult and costly to cut them afterwards.

It is much better to build in stone stairs than to leave spaces for them, and if when fixed proper protection is given them they can come to no harm. If, however, it is necessary to build up the walls and the steps have not arrived, then pockets must be left for them, which is conveniently effected by bricks bedded in sand. All the steps, whether built in or put in at a later date, must be pinned in tight with stout slate and cement, the hanging ends being supported from a solid bearing below. In steps splayed at the back provision should be made for them to have a square wall hold, and where spandrel steps are used the soffit must carry a true line and no portion of any one step project below another, which will frequently happen unless great care is taken in working and fixing them. The C.W. will notice that proper support is given to the stairs, that if of great width rolled steel joist or other section stringers are supplied, and that landings are similarly supported; the architect's consent and written order being, of course, obtained.

As the work proceeds every precaution must be taken to prevent damage to the stone already hoisted and set. All projections and salient angles, etc., must be cased in, and any part of the building not being worked on must have the top of the wall covered over that rain, frost, etc., cannot soak into the work. Weather boarding is frequently used for protecting edges, as also are quartering, bricks, tiles, etc., set in a weak mortar; but with bricks it is very necessary to see that no stain results from their use, as is so often the case where a large percentage of iron abounds in the brick earth from which they are made. When cleaning down time comes, and the scaffold is about to be struck, the clerk of works will insist that no scaffolding is removed until he has inspected the work above it, particularly noticing in cleaning down that no arrises, face work, etc., is spoiled by carelessness at this last stage of the operations, when it is practically impossible to amend or replace the damaged portion.

Only masons should be permitted to set the stone; but it is not unknown, in some quieter parts of the country, where trade union rules are not so much heard of, noticed, or kept, and especially if the bricklayer or bricksetter's rate of wages is lower than that for masons, for the bricklayer to be allowed by the builder to do mason's work; but the clerk of works will not permit this, if he find such to be the case.

It has been mentioned before that delay is annoying both to the architect and builder, so that the clerk of works must use his best endeavours to prevent any. He will see that all detail drawings that are required are supplied in time, and when supplied that they are accurately followed. If inspection in the stoneyard is possible, then the templates can be checked; if not, the stone as delivered can be compared with the drawings. Where stone has to bond in with brickwork it is essential to know the exact height of a number of courses set, and, knowing it, to keep it—if the architect has specified wide joints for the brickwork, an allowance must be made in the height of the stone, as wide joints in stonework are not desirable, they rarely exceed $\frac{1}{2}$ in. in thickness, whereas $\frac{3}{4}$-in. joint for brickwork is very frequently specified.

Stone stairs, landings, hearths, templates, coverstones, bases, etc., and other items of a mason's work do not call for any specific remarks other than those given above.

On a job of fair size the supervision will be assisted largely by the specification, drawings, and quantities, as determining both the quality and quantity required. Each of these three documents should be compared each with each, and any items that do not correspond should be noted, and the architect informed, instructions being asked where necessary.

Architectural Societies.

ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.—An ordinary meeting of the Council of the above was held at 31, South Frederick-street, Dublin, on Monday, October 5, Mr. F. Batchelor (President) in the chair. Among the correspondence dealt with a letter from the Manchester Society of Architects with reference to the Town Planning Bill now before Parliament was read. It was proposed that a similar letter to that of the Manchester Society be sent to the Irish Members of Parliament, dealing especially with the question of "Re-appropriation." The President and Hon. Secretary were deputed to draw up a suitable letter. The Hon. Secretary was instructed to write to the Richmond District Asylum Committee and the Joint Hospital Board regretting that a competition for the buildings about to be erected by these bodies respectively was not held. The President reported that the solicitors had put the by-laws for incorporation in proper form, which papers had been printed and would be sent to members of Council shortly.

LIVERPOOL ARCHITECTURAL SOCIETY.—The Society held the opening meeting of the session on Monday last, when an address was delivered by the President, Mr. T. E. Eccles, at the conclusion of which a vote of thanks was proposed to the President by Mr. W. E. Willink, and supported by Mr. Hastwell

Grayson and Professor Reilly. Part of Mr. Eccles's address is printed on another page.

NORTHERN ARCHITECTURAL ASSOCIATION.—The Council propose to mark the fact that this is their fiftieth session in some special manner. It is suggested that a dinner be held at Newcastle-upon-Tyne on a suitable date during the session, to which the President of the Royal Institute, the President of the Allied Societies, and other gentlemen distinguished for their interest in, and appreciation of, the art of architecture, should be invited as guests. In connexion with this celebration it is also proposed to hold an exhibition of architectural drawings, etc., at the rooms of the Association, and the Hon. Secretary is asking for the loan of any drawings illustrating the work executed during the last fifty years, with special reference to the districts covered by the Association.

SURVEYORS' INSTITUTION.—With a view to encouraging the reading of papers at the ordinary general meetings, the Council have decided to award a Gold Medal for the best paper, if of sufficient merit, read during the session. The Institution library is open from 10 a.m. to 5.30 p.m. every week-day, except Saturdays, when it is open from 10 a.m. to 1 p.m. The rooms of the Institution are open daily, and are available for reference to the library, for arbitrations, writing, appointments, or other business purposes. A copy of the special catalogue of the loan library and regulations for the issue of books can be obtained, free of charge, on application to the secretary.

VICTORIAN INSTITUTE OF ARCHITECTS.—In the *Journal of Proceedings* of the Royal Victorian Institute of Architects a paper by Mr. Gerard Wight deals with the standard specification for Portland cement framed by a board appointed by the Premier of Victoria. The work of this body was considerably facilitated by the specifications previously formulated in other countries, and, so far as we have compared details, the Victorian specification appears to be generally akin to that of the Engineering Standards Committee as revised in 1907. In referring to "free lime" as a principal cause of unsoundness, the author uses a term very largely employed in the past, but which recent investigation shows to be a misnomer. It is difficult to imagine the existence of lime in a free state after subjection in a cement kiln to high temperatures in the presence of acid substances. That unstable lime compounds exist in some Portland cements is no doubt the case, and where they occur unsoundness naturally results. The times of setting stated in the specification are doubtless quite appropriate to many classes of work, but it should be noted that cement capable of developing initial set in fifteen minutes and hard set in one hour is far too rapid for some purposes—notably for reinforced concrete work. A very useful feature of the paper is a plate illustrating various forms of cracks and curvature in pats of cement submitted to tests for soundness. The plate is accompanied by an explanation pointing out the meaning of the cracks and other effects of expansion and contraction.

Engineering Societies.

SOCIETY OF ENGINEERS.—At the meeting on Monday last Mr. H. Conradi read a paper on "The History of Mechanical Traction on Tramways and Roads." He mentioned that the origin of tramways, about 200 years ago, consisted in the laying of straight and parallel pieces of timber from the colliery to the river, for the conveyance of coal. Later on, iron flat bars were fixed on the top of those sleepers, to increase the traction facilities, which gradually developed in the establishment of railways in about the year 1767. The idea of mechanical traction on common roads was, however, not abandoned, and after a first trial in 1769, energetically revived between the years of 1803 to 1836, and periodically continued till about 1872, after which time they were obliged to stop running, on account of the imposition of oppressive taxes and other obstacles, on the part of the local authorities. This revived tramway traction; first by horse and then by mechanical power. The use of steam had, however, never been allowed to develop fairly and firmly, and the local authorities seem to have done their best to hamper its service. Also the Tramway Act of 1870 proved a creation to the detriment of private enterprise. This was followed by the introduction of electric traction, with its different methods by underground or slot-conduit, by surface contact, and by overhead wire; the latter, being the cheapest in cost, was therefore more generally used. The author mentioned that in competition with tramway traction, on account of the permanent way construction, along the ordinary roads, mechanical traction on common roads was again thought of, seeming to be preferable, requiring no rails along the roads. It made rapid development, as now seen in the production of petrol, steam, and electric motor omnibuses and private carriages. The use of the motor omnibuses especially, but also of the private carriages, created, however, many unforeseen and unexpected evils, as destruction of the roads, unhealthy smells from burnt petrol vapours, depreciation of property in towns and country, the destructive nuisance of enormous dust waves, dangers to life of the public, and many other grave difficulties. All these grave difficulties, so detrimental to the public in general, would have to be overcome, if mechanical traction on common roads was to become useful and beneficial to the public. The author then mentioned the necessity of consolidating the roads, and especially of finding means to prevent the raising of such tremendous dust waves, destructive to all kinds of property in town and country; and in electric traction, the destructive wave motion of the rails would have to be overcome. In conclusion, he maintained that steam tramway traction, properly conducted, seemed still to be capable of holding its own against electric and motor omnibus traction, under the same conditions and if the same facilities were given; the cost of installation being less and the cost of working being about the same, even rather less than more.

Legal Column.

WORKMEN'S COMPENSATION.

THE current "Law Reports" contain two cases on workmen's compensation not hitherto noted. The most important of the two cases is Page *v.* Burtwell, as it elucidates sect. 6, of the new Act, which corresponds to a section in the Act of 1897 which caused considerable litigation. The facts are shortly as follows. Burtwell, the respondent, was engaged by the British Xylonite Company to relay some wood blocks on their premises; he employed a sub-contractor, in whose employ was the applicant, and this man received an injury through a trench giving way which incapacitated him for six months. The Xylonite Company, as a matter of fact, paid the man half his wages and his doctor's bill, but the correspondence left it open to doubt whether or not they admitted a lega liability compelling them to do so. The applicant proceeded as well for compensation, not against his employer, the sub-contractor, but against the "principal," Burtwell. This in ordinary circumstances he would be entitled to do under sect. 4, but in the above circumstances Burtwell raised the defence under sect. 6 that, having received a sum by way of damages, the applicant could not also receive compensation. Sect. 6 provides "Where the injury for which compensation is payable under this Act was caused in circumstances creating a legal lability in some person other than the employer to pay damages in respect thereof the workman may take proceedings both against that person to recover damages and against any other person liable to pay compensation under this Act for such compensation, but shall not be entitled to recover both compensation and damages."

It was contended that the "legal liability" could only be ascertained in legal proceedings, and also that the "damages" must have been recovered by legal proceedings. The Court of Appeal negatived these contentions, and held that the first part of the section applies where circumstances exist which it is alleged create a legal liability, and that the latter part is satisfied when there has been a payment and a receipt of the money. This case points out the distinction between the present Act and that of 1897. In the Act of 1897 an option was given to the workman to proceed either at law to recover damages against some person other than the employer or under the Act for compensation against the employer, "but not against both," and some difficulty was experienced in determining what was a proceeding, and whether if it failed the section was operative. The new Act enables double proceedings to be taken; the result alone is regarded.

The second case, Fitzgerald *v.* Clarke & Son, requires but brief notice. A workman, whilst engaged at his work, had a practical joke played upon him by his fellow-workmen whereby he received serious injury. The Court of Appeal, besides following the decision in Armitage *v.* Lancashire and Yorkshire Railway Company (1902), intimated that such an accident could not be said to arise "out of" the employment. The Court laid it down that the accident must result from a risk reasonably incident to the employment or some natural or common cause incidental to the character of the business, but the difficulty of applying such tests is apparent when this case is compared with Rowland *v.* Wright, in which the Court of Appeal decided that a carter who was bitten by a cat kept in the stable to the knowledge of the employer was injured by accident arising "out of" the employment.

THE METROPOLITAN WATER BOARD.

A curious point arose in the case of the Metropolitan Water Board *v.* Soloman. The Grand Junction Waterworks Company were entitled to certain property under a lease which contained a covenant to the effect that the leasehold premises should not be sold, assigned or let without the consent of the lessors, and there was a power to re-enter upon the premises for breach of covenant. By the Metropolis Water Act, 1902, the property of this company, including the leasehold premises, became vested in the Water Board. The Water Board, having no use for the leasehold premises, proposed to assign them at an increased rent, but the defendants refused to give their consent, and the Water Board brought an action claiming a declaration that they were entitled to assign the premises without consent. The Court held that the action failed, as under the Act the transfer of the property to the Water Board was subject to the liabilities and obligations attaching to the property of the Grand Junction Waterworks Company, and the Water Board could only transfer the estate and interest vested in them, and the leasehold in question was held subject to the right of re-entry if a breach of covenant was committed.

RATES FOR SPECIAL SEWAGE EXPENSES.

There is a general principle of law that rates shall not be made retrospective; properties change hands, and the ratepayers of subsequent years may otherwise be called upon to bear burdens which properly should have been laid upon others, but as to all principles exceptions can be found, so there are exceptions to the rule above stated, and the case of Croydon Corporation *v.* Croydon Rural District Council reveals one of such exceptions. By an agreement made under sect. 28 of the Public Health Act, 1875,

the plaintiff Council were to construct certain sewers, whilst the defendants, in their district, were to construct others connected with them, and the defendants were to pay the plaintiffs an annual rent of from 6d. to 8d. on the rateable value of the property in their district. The sewers were constructed, and from April, 1901, to September, 1904, the defendants paid as rent the sums demanded. In 1905 it was discovered that the rent demanded and paid was a less sum than that really due since it had been calculated only on the houses actually connected with the plaintiff's drainage system, instead of upon all the house property in their districts. The plaintiffs then demanded from the defendants the balance down to September, 1904, which amounted to 2,925*l.*, and payment on the proper basis in future, but during negotiations rent was paid on the old footing to September, 1905. The defendants, having 1,000*l.* on hand, also paid this towards reducing the arrears, and they issued precepts under sects. 229, 230 of the Public Health Act, 1875, for special expenses in the districts, but the overseers of the districts refused to levy the rate on the ground that it would be retrospective. The defendants then, having no funds, declined to pay the plaintiffs, and the plaintiffs commenced an action claiming a mandamus to compel the defendants to levy the rate. The Court of Appeal in considered judgments exercised their discretion, and ordered a mandamus to issue in respect of the amount due for the year 1904-5, when a demand was made for the sums correctly due, but not for the sums due before that date; but the judgments show that the Court exhibited some reluctance in exercising the discretion at all, and considered the power to exercise a discretion to make one person liable for the debt of another as somewhat anomalous.

WESTMINSTER CITY COUNCIL.

AT the fortnightly sitting of the Westminster City Council on Thursday last week, the following matters were dealt with:—

Road Repairs.—It was decided to proceed with the repair of Upper Belgrave-street, Belgrave-street, and Victoria-street.

Street Refuges.—On the recommendation of the Works Committee it was decided to erect a refuge and gas lamp in Knightsbridge, east of Wilton-place; and one in the middle of Park-lane at the point where the traffic along the new road south of Marble Arch leaves or enters Park-lane.

District Surveyor's Return for 1907.—The following return was submitted for 1907 with respect to new buildings and alterations to buildings under the London Building Act:—Number of new buildings dealt with in Westminster, 102; fees paid to District Surveyors in respect of these, 505*l.* 8s. 9d.; number of additions, alterations, and other works to buildings, 1,859; fees paid to District Surveyors in respect of these, 3,301*l.* 6s. 3d.; fees paid to District Surveyors under the London Building Acts (Amendment) Act, 1905, 1,264*l.* 4s. 9d.; total number of fees paid to District Surveyors throughout the metropolis, 2,569; total amount paid to the District Surveyors throughout the metropolis, 51,776*l.* 2s. 8d.; total amount of fees paid to District Surveyors in Westminster, 5,070*l.* 19s. 9d.

Motors for Street Cleaning and Watering.—A report was submitted by the Highways Committee dealing with the experience gained from a eleven-weeks' trial of a petrol motor-wagon supplied by Messrs. J. I. Thornycroft & Co., Ltd. The motor-wagon has been used from midnight to 6 a.m. in street watering, preparatory to flushing, and from 6 a.m. to 10 a.m. in dust collection, and the Assistant City Engineer reports that the work done at night equals that of three horses and vans of 360 gallons capacity each, and the work done in dust collection equals that of three horses and vans of 3 cubic yds. capacity each. It was agreed to purchase the wagon.

St. James's Market.—The Improvements Committee reported the receipt of a letter from H.M. Office of Woods, etc., enclosing tracing showing an area of land belonging to the Crown and bounded by Jermyn-street, Market-street, Norris-street, and the Haymarket, and stating that probably at an early date the buildings at present standing on portions of the Crown land will be demolished with a view to rebuilding, and the opportunity might then be taken of effecting a public improvement by widening one of the existing narrow passages leading from Market-street to the Haymarket, and converting it into a roadway 30 ft. wide. The Committee expressed approval of the scheme.

Some discussion took place regarding the adequacy of a 30-ft. road, and eventually the report was referred back to the Committee.

PROPOSED NEW BUILDINGS IN LONDON AND SUBURBS.

HORNSEY.—Additions, 28, Grand-avenue, Muswell Hill, Mr. W. J. Collins, builder, 13, Firs-park, Hornsey; seventeen houses, Southwood Lawn-road, Highgate, Mr. A. G. Shearing, surveyor, 12, Fortress-road, N.W.; laying out Northwood Estate, Mr. J. C. Hill, builder, 55, Glenmore-road; alterations and additions, 10, Victoria-parade, Muswell Hill, Messrs. D. A. Whitehead & Co., 10, Victoria-park, Hornsey.

Plumstead.—Bakehouse, Messrs. Church, Quick, & Whincop, William-street, Woolwich; rebuilding shop, Hudson-road, Messrs. G. Blackler & Sons, 33, Pattison-road, Plumstead; alterations to "Falconwood," Shooter's Hill, for Baroness d'Erlange, per Mr. G. F. Dean, 9, South Molton-street, W.; church and presbytery, Abbey-grove, Abbey Wood, Messrs. Benedict Williamson & J. H. Beart Foss, 27A, Sackville-street, Piccadilly, W.

Leytonstone.—Alterations to Cowley Arms public-house, High-road, for Mr. W. Dorton, licensed victualler.

Leyton.—Additions to workshop, Mr. F. J. Coxhead, builder, Bulmer-road, E.; sheds, stores, etc., at London Electric Wire Company's premises, Church-road, Mr. A. W. Hudson, architect, 87, Finsbury-pavement, E.C.; institute in connexion with Christ Church, Messrs. Mattock Brothers, builders, Winkfield-road, Wood Green, N.; shop, stores, and house, High-road, for Stratford Co-operative Society; seven houses, Grange-road, Mr. A. G. Martyn.

Ealing.—Lammas Council school, for Ealing Education Committee (15,969*l.*). Messrs. Spencer, Santo, & Co., builders, 22, Kensington High-street, W.

Eltham.—Six houses, Dumbreck-road, Mr. J. J. Bassett, 121, Earshall-road, Eltham; new branch in High-street, for London and South-Western Banking Company, 170, Fenchurch-street, E.C.

Woolwich.—Two double houses, Elizabeth-street, Mr. W. Harris, Steam Joinery Works, North Woolwich; rebuilding of three houses, Sand-street, Mr. S. A. Douglass, 17, Tiliæ-road, Plumstead; iron building (temporary dining-room) for Western Electric Company, Messrs. J. Grover & Sons, builders, Wilton Works, Islington, N.; enlarging Maitland Cottage Sanatorium, Mr. W. F. D. Smith, M.P. (Chairman of Committee), 3, Grosvenor-place, S.W.

Wimbledon.—Pavilion at Royal Wimbledon Golf Club; alterations and additions to Wimbledon Town Golf Club-house; two houses, Dora-road, Messrs. Boyton, Sons, & Trevor, surveyors, High Holborn, W.C.; shop and warehouse, Merton-road, Mr. J. K. Skewes, draper, Broadway, Wimbledon; alterations and additions to "Port-y-Vullin," Fairlawn-road, Mr. J. S. Brocklesby.

Bromley.—Additions to residence, Freelands-road, Messrs. Pearce Brothers, builders, 37, Hawes-road, Bromley; residence, St. George's-road; and motor-shed, Mr. G. W. Hart, Redington-road, N.W.

Ilford.—Alterations and additions (640*l.*) to school, Beehive-lane, Mr. C. J. Dawson, architect, 11, Cranbrook-street, Ilford.

Lambeth.—Alterations, etc., to cemetery church, Tooting, Mr. E. Hoare, architect, care of the Bishop of Southwark, Bishop's House, South-place, Kennington, S.E.; five houses, Brockwell Park-gardens, Mr. H. D. Wood (owner); six houses, Dumbarton-road, Brixton Hill, Mr. Edward Willson (owner).

Westminster.—Shop, Brompton-road, S.E., on site of All Saints' School. Mr. C. H. Townsend, architect, 32, Great George-street, S.W.

Chelsea.—New street from Marlborough-street to Leader-street, Chelsea, Messrs. Lamb, Son, & Prance, solicitors, 17, Ironmonger-lane, E.C.; addition to buildings in Hans-place, Chelsea, Mr. J. Cash, architect, 22, Surrey-street, Strand, W.C.

Wandsworth.—Alterations and additions at De Never's Rubber Tyre Company's Works, Bendon Valley, Springfield, Mr. W. Harbrow, builder, South Bermondsey Station, S.E.; additions at Windsor Works, Venn-street, Clapham, North, Messrs. H. Somerford & Son, builders, Manor-street, Clapham, S.W.; lodge at Gayton Lodge, Wimbledon Park side, Southfield, Messrs. Maple & Co., Ltd., Tottenham Court-road, W.; eleven houses, Southfield, Messrs. Woodley Brothers, merchants, Wimbledon-road, Tooting Graveney; four houses, Birchwood-road, Streatham, Mr. J. Riches; workshop, stable, etc., Biegborough-road, Streatham, Mr. J. Deryck.

Kensington.—Covered playground, etc., for Lady Superior of the Convent of Our Lady of Zion, Messrs. Hallowes, Carter, & Ellis, solicitors, 39, Bedford-row, W.C.

Lewisham.—Three houses, Messrs. W. J. Scudamore & Sons, builders, Manor-lane, Lewisham, S.E.; additions, "Kirklynton," Messrs. R. Jenner & Sons, builders, Mount Pleasant, Sydenham Hill-road, S.E.

Poplar.—Motor garage at Messrs. Clicksten's timber yard, Wansbeck-road, Messrs. Taylor Brothers, builders, 45, Hothbury-road, Hackney, N.E.

Kingston (Surrey).—Pavilion for Corporation. Mr. R. Hampton Clucas, Surveyor, Kingston Corporation.

Mortlake.—New ward block (2,150*l.*) at isolation hospital, Mr. G. Bruce Tomes, Surveyor, Urban District Council, Council House, High-street, Mortlake.

Hackney.—Fourteen houses, Clapton Common and Spring-hill, Mr. O. C. Chillingworth; offices, store-shed, etc., Plover-street, Hackney Wick, Mr. A. E. Bradshaw.

East Ham.—Nine houses, Burges-road South, Mr. C. Bush; range of stables, cottage, and milk store, Aldersbrook-lane, Mr. W. H. Crockcroft.

Hendon.—Additions to "Fives Court," Nower-hill, for Mr. A. Heal; sixteen houses, Beresford-road, for Mr. E. H. Waterman; four houses in Harrow-view, for Mr. E. Armstrong.

Stepney.—Building, Christian-street, Messrs. M. W. King & Son, surveyors, 6, Holborn Viaduct, London; rebuilding houses, Duval-street, Mr. C. E. Salmon, architect, Bell-street, Reigate; rebuilding houses, Jubilee-street, Messrs. Watkins, Baylis, & Chidson, solicitors, 11, Sackville-street, W.; building, Bewley-street, Messrs. J. Smith & Co.

Fulham.—Office building in North End-road, Mr. A. Wheatley, Midland Railway Company, Chief Offices, Derby.

THE PALACE THEATRE, SHAFTESBURY-AVENUE.

AS ORIGINALLY built, the top tier of this theatre was divided into two places, amphitheatre and gallery, a jump of about 4 ft. high occurring between them. In recent years these two parts have been used together as gallery, at one price, and this "jump" was most objectionable, as it prevented intercommunication, and, further, as the rows of the amphitheatre seats (holding from forty to sixty persons in each) had no way in or out except at the very ends of each row (intermediate gangways being impossible as constructed), it will be realised that a stronger word than inconvenient might easily be used.

The remedy has been the new amphitheatre opened to the public on September 21. The whole of the two, then existing, front rows and the steelwork supporting them was cut away, new constructional steelwork was attached at a higher level and a slightly greater projection; this allowed of an entirely new shape to the line of the front, and after that was in the remainder was practicaly formed over and upon the old steel on entirely new lines. The walls at the sides of the gallery forming the amphitheatre passages have been removed, and the whole space between the main walls has been thrown open and utilised. The result is one large open tier formed on an even rake from front to back, each row being 2 ft. 5 in. wide. Provided with two gangways running straight down through the whole of the steppings, and the five front rows having in addition exits into the side passages, and all the chairs being "tip-up," the access to the seats is very easy and the egress free, rapid, and safe. The sighting is especially good, every seat commanding a view of the whole stage.

Small portions of the old amphitheatre have been left on each side of the house adjoining the boxes, and they form short side-galleries, behind and above which standing space has been built provided with convenient leaning rails.

This alteration to and change in the shape of the amphitheatre front has raised the under soffit some 18 in., thus greatly improving the sighting and airiness of the first circle below. This circle has also been considerably improved by the removal of the dwarf walls surrounding it, and the substitution of ornamental iron barriers; the gangways have been enlarged, and now every row of seats discharges into a gangway at both ends. The upper part of the house and the ceiling have been redecorated. The whole of the foregoing works have been completed within the short space of six weeks. The gallery has of necessity been closed, but the remainder of the house has been open, and the ordinary eight performances a week have been carried on the whole time.

The architect is Mr. J. Emblin Walker, of London; Messrs. Hy. Lovatt, builders (Wolverhampton), and Messrs. Richard Moreland, engineers (London), have carried out this rapid piece of work in a most admirable manner, and absolutely up to time. Messrs. Shoolbred have put in the special chairs, upwards of 400 in the amphitheatre and 240 in the first circle. The stalls and royal circle have also recently been enlarged and reseated, and many other improvements carried out, both before and behind the curtain, to meet the wishes of the London County Council.

It is claimed that this theatre is now one of the safest and most comfortable in London.

TRIBUNAL OF APPEAL CASE.

A SITTING of the Tribunal of Appeal under the London Building Act, 1894, was fixed to be held at the Surveyors' Institution on Friday to hear—(1) An appeal by Mr. Robert Herbert Measures against the certificate of the Superintending Architect of Metropolitan Buildings, dated July 31, 1908, defining the general line of buildings on the south-west side of Tooting Bec-gardens, Wandsworth, between Mitcham-lane and Ambleside-avenue; and (2) an appeal by the County of London Electric Supply Company, Ltd., against the aforesaid certificate.

As the result of notice from the parties, who have been in conference, the sitting was adjourned *sine die*.

Competitions.

SOUTH WALES COTTAGE EXHIBITION, 1909.—In the competition for the best laying out of the ground for this exhibition, to be held at Swansea next year, the gold medal for the best plan has been awarded to Mr. James Crossland (Broughton-in-Furness); the silver medal to Mr. Gilbert Waterhouse (Buckhurst Hill, Essex); and a third place to the plan by Mr. John W. Aldiss (Newbridge, Mon.). The author of the gold medal plan, which will we presume be adopted, has followed the method of first contouring the ground completely, and then arranging his roads so that the greater lengths of them follow the same level of contour, and are approximately level. This seems practical in a sense, but the result on the plan as shown is to a collection of drives in nondescript irregular curves, like the XIXth century fashion of garden-walks. As far as the artistic laying out of ground is concerned, this plan is of a retrograde character.

ADDITIONS TO ISLINGTON WORKHOUSE.—At the meeting of the Islington Guardians on October 1 the competition in regard to the receiving wards again came up for consideration. A report from the Accommodation Committee was to the effect that, in pursuance of instructions given, Mr. Lockwood, architect, had prepared amended plans on the lines named in the report adopted by the Board on September 3. The Assistant Architect of the Local Government Board had written intimating that he had discussed the revised plans with Mr. Oxley, and they had made a few suggestions on them. Subject to these being carried out they thought the plans would be accepted by the Local Government Board. The Committee, having had the plans again before them, recommend that same be sanctioned by the Guardians and forwarded to the Local Government Board for approval. The Committee were informed that the additional work suggested would cost 50*l.* or 60*l.* in addition to the 2,000*l.* previously stated. Mr. Lockwood would, however, send a communication as to the estimated cost of the whole. On the report coming up, Mr. W. Malins, the Chairman of the Committee, declined to move same, and this duty was undertaken by Mr. Bryen. He submitted that what was proposed was the best way to deal with the matter. Mr. Malins said that the successful competitor had been absolutely ignored, and he (the speaker) was sorry to say that there was a reason for this being done. It was quite possible for any member to ascertain who was the author of the 2,000*l.* plan, seeing that there were only seven competitors, and the amounts were given. He moved as an amendment to the adoption of the report that it be an instruction to the Committee to call in the architect of plan A, and see if it were possible to adopt his scheme. Mr. J. B. Lander, in seconding the amendment, said that the facts warranted an appeal to the Local Government Board. The amendment was carried by thirteen votes to four, and on being put as a substantive resolution Mr. Tomkins moved that the whole matter be referred back to the Committee for consideration and report. This latter proposal was finally carried, with two dissentients. Mr. J. B. Lander moved that the facts be laid before the Local Government Board and an inquiry asked for. The Chairman deprecated this motion, and Mr. Doy moved the next business, which was carried. Mr. J. B. Lander said he would at once resign his seat on the Board and communicate the facts to the Local Government Board.

HIGH SCHOOL FOR ROTHERHAM.—Rotherham Education Committee has (subject to the usual sanction) appointed Mr. E. R. Robson, London, as the assessor in connexion with the competition of plans for the erection of a higher standard school at South-grove. Mr. Robson is to be given power to make no award if, in his opinion, the plans submitted are unsuitable.

SECONDARY SCHOOL, BURY.—The date for sending in designs for this competition has been extended to November 31.

CONGREGATIONAL CHURCH-HOUSE, MANCHESTER.—The award of Mr. Paul Ogden, F.R.I.B.A., the assessor in the competition for the above building, has just been announced. The design placed first was prepared by Messrs. Bradshaw & Gass, of Bolton. The design by Messrs. J. Gibbons & Son was placed second, and that by Messrs. J. & J. Swarbrick third. Many designs were submitted, and they were all of a very meritorious character. Arrangements have been made for the designs to be exhibited in the rooms of the Manchester Society of Architects, 16, St. Mary's-parsonage, Manchester, from Tuesday, October 6, to Tuesday, October 13, 1908.

KIRKWALL CATHEDRAL RESTORATION. — In furtherance of the scheme for the restoration of St. Magnus Cathedral, Kirkwall, under the will of the late Sheriff Thoms, the Provost and Magistrates of Kirkwall, who are the trustees, asked the following three architects to report on the best manner of carrying out the work:—Messrs. George Mackie Watson, Hippolyte J. Blanc, and John Kinross. The trustees have resolved to adopt the scheme recommended by Mr. Watson, 50, Queen-street, Edinburgh. The trustees already have some 30,000*l.* in hand, and with the expiry of certain life-rents it is calculated there will fall to them an additional 20,000*l.*

Trade Catalogues.

MESSRS. F. W. BIRD & SON, of East Walpole, U.S.A., are the manufacturers of "Paroid Roofing," of which we have received a sample. It is made by subjecting felt to a waterproofing treatment and then coating it on both sides with pliable waterproof material. Paroid roofing has long been used in America as a roofing material for farm buildings, barns, and poultry houses, and appears to be well suited for use in most cases in which it is not essential that the roofing should be fireproof. The British agents are Messrs. E. G. Buchanan & Stevenson, of Leith.

We have received from the Yale & Towne Company a copy of their "Brief Catalogue of Yale Products," No. 2 E. This is a well-produced and handy book of 168 pages in stiff covers, and contains some information of general interest, including a glossary (with illustrations) of technical terms relating to locks and hardware, explanations of the "hand" of doors on the English basis (which is the reverse of the American), and short articles on master-keyed locks, the care of locks, etc. The catalogue itself is divided into nine sections, dealing with night-latches, dead locks, padlocks, general hardware, plain lock-sets, keys and blanks, ornamental hardware, cabinet locks, and the Blount door-check and spring. Full particulars of the various articles are given in the fewest possible words, and cross-references are inserted where necessary, so that it is an easy matter to find out whether the fitting or one of its modifications is suitable for the purpose required. To take an example at random—the No. 240 lock; in addition to the dimensions and other particulars, there are references to p. 98 for the price of extra keys, to p. 10 for the hand of doors, and to p. 89 for the cost of master keying. Among the night-latches are some examples of "rim latch-locks," the latch-bolt being operated by key from outside and by knob from inside, and the dead bolt by key from either side, and there is also a mortise dead-locking night-latch. The catalogue will be a handy book of reference for architects and builders.

From the Builders' Material and Supply Stores we have received a convenient and well-bound catalogue of 140 pages, containing illustrations and descriptions (and in nearly all cases prices also) of all the ordinary building materials, including bricks, plasters, drain pipes and traps, chimney-pots, roof tiles, fire tiles and bricks, slates, damp-courses, metal lathing, fire-resisting partitions, etc. Section II. deals with water-closets, lavatories, urinals, sinks, iron and lead soil pipes, lead traps and bends, manhole covers, eaves-gutters, plumbers' and gasfitters' brasswork, etc. Reference is facilitated by a good index.

Messrs. Richard Crittall & Co. have sent us an interesting catalogue entitled "Heating without Excavation." It contains a short but clear account (with illustrations) of the Cable system of heating. The return water is heated by direct contact with steam, and is forced up to a pressure and expansion tank at a higher level, from which the flow-pipe is taken off. The pipes required are very small, ranging from ¼ in. in diameter upwards, and it is said that any desired temperature up to boiling-point can be automatically maintained by means of the regulating lever. The steam pressure and the difference in temperature between the flow and the return water are relied upon to secure a proper circulation without the aid of pumps.

The Nautilus Fire Company have issued a catalogue showing their "New Improved Nautilus Grates and Ranges." The general features of the Nautilus grate are so well known that description is unnecessary, but the new catalogue shows that many modifications have been made, particularly in the direction of simplicity of design, and from the artistic point of view with excellent results. Illustrations are given of a number of mantelpieces in combination with Nautilus grates, and ten pages are devoted to the Nautilus cooking-range and the simple but well-contrived "Mermaid" patent boiler. A method of heating hot-water radiators from a Nautilus grate is also shown.

Messrs. Fenlon & Son have sent us a copy of their new catalogue, containing illustrations and descriptions of Fenlon's & Shrewsbury's special hot-water apparatus. Nearly all the appliances are heated by gas or oil, and many of them are decidedly ingenious. They include a number of simple varieties of heating apparatus for horticultural work, radiators for houses and other buildings, gas-heated boilers for domestic hot-water supply, an automatic washing copper, geysers for baths, gas and oil stoves, etc. Among the geysers are different varieties of the Fleet, Tudor, and Calda geysers.

From Messrs. Mountain & Gibson (Bury, Lancashire) we have received a leaflet showing some of their electric tramway cars, etc., and also a small catalogue dealing with the "rolling doors and shutters" made by the Jas. G. Wilson Manufacturing Company (Norfolk, U.S.A.). The doors and shutters are mainly of the revolving type with interlocking steel slats, but wood revolving shutters are also shown, and others of wood and steel with asbestos packing between the two materials. Mention may also be made of the "swing sliding doors," fitted with automatic fusible release to close in case of fire. When open the door stands out horizontally from the top of the doorway like a large shelf; in closing two pivots fixed at the heels of the door slide down vertical guides or jambs, and by suitable mechanism the door is brought to a vertical position closing the opening.

We have received from Messrs. R. E. Pearse & Co. four leaflets containing illustrations of their various sections (simple and complex) for wrought-iron casements, and of their "Open-both-ways" patent casement, which can be easily reversed for cleaning.

Messrs. Hope & Sons (Birmingham) have sent us an eight-page catalogue containing details of their patent roof-glazing with lead-encased steel bars and gun-metal shoes. Photographic illustrations of some large roofs glazed by the firm are also given.

Mason's Gas Power Company, of Manchester, send us a catalogue containing particulars of Duff gas producers for internal combustion engines and industrial purposes generally where heat is required. These producers are made in five sizes capable of gasifying from 1 cwt. to 15 cwt. of fuel per hour. Larger gas-power plants are also described and illustrated of types suitable for gas-engines up to 500 brake-horse-power, and the remaining sheets of the catalogue are devoted to gas-fired furnaces for annealing wire and malleable castings, heating steel slabs, plates, and bars, and for kindred operations.

Weldless Chains, Ltd., of Coatbridge, send us a pamphlet they have recently issued entitled "The Very Last Word on Chains." So far as we can judge this is likely to justify its title in every respect connected with the manufacture of steel chains. Until quite recently the best form of chain was one of iron with welded links, but by the invention of Mr. Strathern it is now possible to produce weldless chain from a steel bar of cruciform section, the bar being pressed while hot into link form by powerful machinery. The result is a chain of exceptional strength capable of withstanding a breaking strain of approximately double the Admiralty requirements. The Strathern patent is worked by Weldless Chains, Ltd., whose

products are approximately half the weight of ordinary chains of the same strength. This reduction of weight is in itself an advantage quite apart from the longer life of steel as compared with wrought iron. Architects who are not familiar with the absurd terminology of some chain makers may take a useful hint from this book that the "best" chain is very often only the third or fourth quality, being preceded by "Best Best," "Treble Best," and other brands named so as to mislead the uninitiated. Therefore architects who want the very best chain obtainable must be particular to say so in language that cannot be nullified by trade terms. It is stated in this pamphlet that to get the best chain the proper course is to specify "Strathern's weldless steel chain"—a recommendation which we are by no means inclined to controvert.

BOOKS RECEIVED.

ARCHITECTURAL EDUCATION. By Wilfrid I. Travers, A.R.I.B.A. (Harrison, Jehring, & Co.)

THE EDWARDIAN INVENTORIES FOR BUCKINGHAMSHIRE. Edited by F. C. Eeles, F.S.A.Scot. (Longmans, Green, & Co. 21s.)

A SHORT HISTORY OF ENGRAVING AND ETCHING. By A. M. Hind. (Archibald Constable & Co. 18s.)

CHIP CARVING AND OTHER SURFACE CARVING. By Eleanor Rowe. (B. T. Batsford, 94, High Holborn. 1s. 6d. and 1s.)

ENGLISH HOUSES AND GARDENS OF THE XVIITH AND XVIIITH CENTURIES. A Series of Bird's-eye Views, with Notes by Mervyn Macartney, F.S.A. (B. T. Batsford. 15s.)

SOME SCULPTURAL WORKS OF NICHOLAS STONE: 1586-1647. By A. E. Bullock, A.R.I.B.A. (B. T. Batsford. 5s.)

THE PETIT TRIANON, VERSAILLES. By James A. Arnott and John Wilson. Part III. (B. T. Batsford. 21s.)

Obituary.

GENERAL RUNDALL.—We have to record the death a few days since, at the age of 84, of General Rundall, C.S.I., a distinguished member of the Corps of Royal Engineers, who filled a very important part in engineering work in India for many years. An Indian career seemed almost pointed out for him, for he was born at Madras, his father being a Colonel in the East India Company's service, in which he also obtained a commission in 1841, in the Company's engineer corps, and spent thirty years in India, where he held several appointments in the Public Works Department, and also served in the Godavery district as assistant to Sir Arthur Cotton. He was chief Government engineer in the Bengal Irrigation Department, and from 1871 to 1874 was Inspector-General of Irrigation to the Government of India. During his later residence in England, after his retirement from Government service, he contributed some important articles to this journal on harbour and tidal river work. He was always strongly opposed to any scheme for reducing the tidal flow of the Thames by additional weirs; maintaining, from his long experience of the behaviour of tidal rivers, that any shutting out of the run of the tidal water on the Thames would be the first stage towards the silting up of the port of London; an opinion which is worth bearing in mind when there is so much talk of schemes for changing the lower reaches of the Thames into a locked basin. It may be of interest to add that General Rundall's daughter married the late Dr. Charles, formerly of Rome, and the two clever ladies who are the only lady Associates of the Institute of Architects are his grand-daughters.

General Building News.

NEW CHURCH, SPENCER'S WOOD.—On the 29th ult. the new church of St. Michael and All Angels at Spencer's Wood was dedicated by the Bishop of Oxford. The church has seating accommodation for 270. The walls are of brick both inside and out, with stone dressings. The flooring of the seated parts of the nave is of pitch-pine blocks, and all other floors are of tile paving. The roof is of open construction, and is covered with boarding and Reading tiles. The church is warmed by hot-water radiators. Gas is supplied for artificial lighting by the use of Graetzin inverted burners. The architect was Mr. S. Slingsby Stallwood, F.S.A., of Reading, and the builder Mr. Charles Aldridge, of Spencer's Wood. The stained-glass east window is by Messrs. Powell, of Whitefriars.

NEW CHURCH, LIVERPOOL.—The new parish church of Emmanuel, Fazakerley, has now been opened. The building has been constructed of Ruabon bricks and Storeton stone, with green slate roof. The flooring is of wood blocks except the chancel, which is tiled. Seating accommodation is provided for 800 worshippers. On the ground floor there is a baptistery at the west end, a nave, chancel, choir and clergy vestries, organ-chamber, the total dimensions of the church being, length 135 ft., 96 ft. wide (outside measurements). The architects were Messrs. W. H. Ward & W. G. Cogswell, and the builder Mr. Isaac Dilworth, Wavertree. The total cost of the site and building is 10,000*l.*

CEMETERY CHURCH AT TOOTING.—Mr. E. Hoare, architect, on behalf of the Bishop of Southwark (Right Rev. E. Talbot, D.D.), has prepared plans, which have been approved, for improvements at the cemetery church, Tooting. The projected works include the construction of a vaulted ceiling decorated with mouldings and enrichments, the provision of a panelled reredos and Holy table, a scheme of mural decoration in colours to be carried out on the walls, and alterations of the seating.

NEW CHURCH, PONTYPRIDD.—The consecration has just taken place of the newly-erected Church of St. Mathew, Coedpenmaen, Pontypridd. The church, which has been erected at a cost of over 4,300*l.*, provides seating accommodation for over 500 worshippers. The work has been carried out by the builders, Messrs. Williams & James, Coedpenmaen, from designs and under the direction of Messrs. A. O. Evans, Williams, & Evans, Mr. W. Augustus, of Cardiff, being clerk of the works.

ROMAN CATHOLIC CHURCH, GLASGOW.—A new Roman Catholic church, dedicated to St. Aloysius, is being built at the corner of Rose-street and Hill-street, Garnet Hill. The work is being carried out from designs prepared by Mr. C. J. Menart, architect.

METHODIST CHURCH, CAMBORNE. — The memorial-stones have been laid of a U.M. church on a site facing Trelowarren-street and in the centre of this town. There will be accommodation for over 500 persons in the gallery and ground floor. The building will be principally of granite, relieved with pink elvan. The building will cost about 2,500*l.*, and the contractors are Messrs. Mitchel, Bond, & Hodge, the architect being Mr. Sampson Hill.

CHURCH SCHOOL, WICKFORD.—A new church school has been built at Wickford to replace the one destroyed by fire in January last. The new buildings consist of a room for infants, a large room for the mixed school, a classroom for forty children, and a house for the master. Mr. F. Whitmore, the County Architect, was the designer.

BOARD SCHOOL, COMRIE.—New school buildings are being erected in Comrie at a cost of about 3,500*l.* The work is being carried out from designs by Mr. G. T. Ewing, architect, of Pitkellony.

CONGREGATIONAL SUNDAY SCHOOL, LEEDS.—New school premises have been built in connexion with the Bethel Congregational Church at Wortley. The building consists of three large classrooms in the basement, and a schoolroom on the ground floor, which will seat 200 scholars. It is of pressed bricks, with stone dressings, and the cost is about 1,300*l.* The architect was Mr. G. F. Danby, and the contractors Messrs. Dews & Co., of Leeds, and Messrs. Thrickett & Sons, of Bramley.

CHURCH HOUSE AND INSTITUTE, BOURNEMOUTH.—A church house and institute has been erected in the parish of St. Michael's, Bournemouth. The main building consists of two floors. On the upper one is placed the main hall, capable of holding about 300 people, whilst there is a raised stage at the western end with a dressing-room adjoining. The stage can be screened off from the hall in order to form a classroom, and the hall itself can be divided in two compartments by means of a glazed folding partition. The lower floor will be used chiefly by members of the Institute. All the principal rooms have fireplaces, and in addition the building will be heated with hot water, while electricity has been installed throughout. The windows have Doulton stone mullions, with dressings, etc., of the same, while the roofs are constructed of grey Cornish slates. The builders were Messrs. Baker & Pearcy, of Parkstone, the architects being Messrs. J. Oldrid Scott & Sons, of Westminster.

CHURCH HALL, BELFAST.—A hall has been erected at Elmwood-avenue in connexion with All Souls Church. The new building is constructed of brick and stone, with tiled roofs. The plans were prepared by and the work executed under the superintendence of the architect, Mr. W. J. Gilliland, of Belfast, and the general building work has been carried out by Messrs. W. J. Campbell & Son, Ravenhill-road. The subsidiary works have been executed by the following:—Leaded glass work, Messrs. Ward & Partners; terrazzo flooring, Ebner & Co.; plumbing, Mr. John Clements; heating, Messrs. Musgrave & Co., Ltd.; electric lighting, Buick & Co.

CLUB-HOUSE, LYNE.—This is a small building between Chertsey and Virginia Water, for the use of club members living in the neighbourhood. The instructions to the architect were to design a building of simple character that would not be out of harmony with the old buildings in the village, and this instruction has been well carried out in a simple building of T.L.B. bricks, with a plinth of purple bricks. The exposed timbers in the play-room and porch are left as from the saw and treated with dark soligium. The general scheme of colour is—doors, skirtings, etc., stained green and varnished; door and window frames and their casements painted white. The principal rooms are warmed with hot-water radiators. Messrs. T. Knight & Sons (Chertsey) are the general contractors; heating was done by Messrs. Rosser & Russell; fireplaces and lavatory fitings by Messrs. Ames & Hunter; slating by Messrs. Braby & Co. Mr. R. W. Coventry Dick is the architect.

POST-OFFICE, DARTMOUTH.—A new post-office has been erected on the South-parade at Dartmouth by Messrs. Heydon & Ferris. The building has a frontage on the South-parade of 45 ft., rising to an altitude of 44 ft. The base up to the plinth is of dressed limestone, and the remainder is of red facing bricks and Bath stone dressings, the whole terminating with a massive stone cornice and parapet. On the ground floor are the public office, 36 ft. long by 20 ft. wide and 12 ft. in height, the sorting office, postmen's retiring-room, bag-room, lavatories, and necessary conveniences. On the first floor are situate telegraph and telephone offices, postmaster's office, male and female clerks' rooms, with lavatories, etc., attached, and a room for the boy messengers. On the second floor are the battery-room, storerooms, caretaker's parlour, kitchen, and bedroom, with offices, etc. The building has been erected from the designs of and under the superintendence of Mr. E. H. Back, architect, Dartmouth.

EXTENSION OF ORPHAN HOMES, BRIDGE OF WEIR.—The Orphan Homes of Scotland at Bridge of Weir have been enlarged by the addition of three new buildings. The additions consist of a school and two homes. The school has been erected at a cost of 3,000*l.*, providing 650 new school places. The connecting-link with the original building is made to form a central hall 80 ft. long by 26 ft. broad. The two homes have been erected at a cost of 2,000*l.* and 4,300*l.* respectively. The buildings were designed by Mr. Andrew F. Bryden, of Messrs. R. A. Bryden & Robertson, architects, Glasgow.

THE "AULD BRIG," AYR.—The hon. secretaries to the Preservation Committee have received the following report from Mr. W. S. Wilson:—"The underpinning of pier No. 3 and the east cutwater has been finished. This leaves the west cutwater only to be dealt with. The work at this pier has been more difficult than at either of the others, and consequently progress has been slow. The concrete jack arching for two-thirds of the length of the bridge is completed and ready for the finished roadway. Good progress is being made in cutting out decayed stones where this is absolutely necessary for the stability of the bridge. There are thirty men at present engaged on the work."

ADDITION TO PADDINGTON WORKHOUSE.—The Building Committee of the Paddington Guardians has considered plans prepared by Mr. F. J. Smith, architect, for the extension of the dining-hall at the workhouse. The Committee agreed to extend the hall by 34 ft. on the eastern side, thereby obtaining an increase of floor space for the accommodation of 277 persons. The approximate estimate of cost is 2,909*l.*, including 1,162*l.* for the structure of new buildings (39,800 cubic ft., at 7d. per foot), 500*l.* for alterations to existing buildings, 325*l.* for covered way, and 300*l.* for heating apparatus. The scheme has been submitted to the Local Government Board for their approval.

LIBRARY IMPROVEMENTS, DUNDEE.—A scheme of improvement has just been carried out at the lending department of the Dundee Central Library. The plans were the work of Mr. James Thomson, the City Architect.

LUNATIC ASYLUM EXTENSION IN IRELAND.—The Richmond Asylum Committee, Dublin, have in hand a scheme for extending the accommodation in the Richmond and Portrane institutions, the enlargements being rendered necessary by the obligation imposed on the committee to provide for the transfer to the asylums of the lunatics now accommodated in the workhouses in the contributory areas—Dublin city and county, with the counties of Wicklow and Louth. The projected alterations and extensions are designed to provide for an additional 400 patients, together with the building of an isolation hospital at Portrane. Plans and estimates, prepared by Mr. George T. Moore, M.Inst.C.E.I., of Dublin, have been approved.

The estimate for the stone work of the new buildings at Richmond alone is 42,000*l.*, and the ultimate cost will probably exceed 50,000*l.*

SOLDIERS' HOME, WINCHESTER.—A home for soldiers has been built in the Broadway, Winchester. Messrs. Wort & Way, of Salisbury, have been the contractors for the work, which was carried out from the designs of Mr. T. Stopher, architect.

PROPOSED PAVILION, TORQUAY.—It is proposed to erect a pavilion in the Princess Gardens, and the Town Council's Finance Committee are at present considering plans submitted to them by Messrs. W. Ball, jun., & G. H. Iredale. The pavilion will consist, in the main, of a large hall, measuring in length 127 ft. and in width 60 ft., a bath saloon 100 ft. in length and 50 ft. in width. There will be a stage, measuring 30 ft. in width, on either side of which will be dressing-rooms and green-rooms, etc.

POLICE-STATION, REDCAR.—A police-station has been erected at Redcar by the North Riding Standing Joint Committee. The building, which has cost 6,000*l.*, is situated behind the main street of the town, and contains residences for an inspector and sergeant, quarters for ten single constables, two offices, muster-room, sitting, dining, sick, and nurses' rooms, together with cells, etc. Mr. W. Brierley, York, was architect, and Mr. Paul Rhodes, Leeds, carried out the contract.

BAKERY, LESMAHAGOW.—A bakery has been erected at Lesmahagow by the Coalburn District Co-operative Society. The bakery and engineering specialists, Messrs. T. Melvin & Sons, Ltd., of Glasgow, prepared the plans, etc. The interior of the buildings is lined throughout with Shawsrigg white enamelled bricks, while the exterior is faced with Auchinlea terra-cotta facing brick. The buildings were erected under the supervision of Mr. A. M. Gilmore, architect, Lesmahagow, the contractors being:—Builder, Mr. Wm. B. Fairservice, Lesmahagow; cement and plaster work, Messrs. Bertram & Son; slater, Messrs. John Bertram & Sons, Strathaven; joiner, Mr. John Simpson, Lesmahagow; plumber, Messrs. J. L. Crosbie & Co., Lesmahagow; ironwork, Messrs. Bladen & Co., Glasgow; painter, Messrs. J. & R. Smith, Lesmahagow.

LADY STEPHENSON LIBRARY, WALKER, NEWCASTLE.—This building, erected at the cost of Sir W. H. Stephenson, D.C.L., as a memorial to his deceased wife, was opened on October 7. It is the third branch library presented by the same donor, the first having been erected at Elswick in 1895, and the second at Heaton in 1898. The whole of the work has been carried out from the designs and under the superintendence of Mr. John W. Dyson, architect, Newcastle. The general contractors were Messrs. S. F. Davidson & Miller; the tiling, of Madeley wood brindled tiles, was entrusted to Mr. John Hewitson; the Breccian marble floor of the entrance hall was laid by the Art Pavements and Decorations, Ltd., London; the windows were filled with lead glazing by Messrs. Atkinson Brothers, and Messrs. Reed, Millican, & Co. The building is heated by hot water, the system having been installed by the R. I. Ward Company.

Sanitary and Engineering News.

NEW SEWERAGE WORKS, MACHYNLLETH.—A sewerage scheme has been carried out at Machynlleth, Montgomery, at a cost of 4,000*l.* The new works have been constructed from a scheme prepared by Mr. S. R. Lowcock, of Westminster, who was also the engineer. The construction was in the hands of Messrs. Ward & Tetley, of Bradford, and Mr. E. J. W. Cutler was the resident engineer.

SEWERAGE, ETC., RISCA.—Application having been made by the Risca District Council to the Local Government Board for sanction to borrow 13,000*l.* for subsidiary sewerage, 2,841*l.* for private roads, and 959*l.* for private street improvements, an inquiry was held by Mr. P. M. Craithwaite. The Surveyor, Mr. A. J. Dardis, was among those who gave evidence.

RYE HARBOUR SEWERAGE.—Mr. T. J. Mossflower, C.E., of Westminster and Bristol, attended a recent meeting of the Rye Rural District Council and explained the plans, etc., illustrative of the scheme of drainage which he had prepared for the drainage of Rye Harbour. He gave particulars of the tidal observations and float experiments which he had made, and produced charts showing the rise and fall of the tide inside the harbour for a period of fifteen days. He referred to the impracticability of successfully dealing with the sewage without pumping, and to the treacherous nature of the ground as revealed by borings and trial holes, and the difficulty that would be met with in constructing the sewers, and the impossibility of adopting the usual methods of construction. The scheme proposed is to carry the sewage to a central spot, and there lift it by means of centrifugal pumps, worked by oil-engines, to a tank sewer with penstock chamber and automatic valves to be constructed on the foreshore. The sewage will be retained in the tank sewer during certain periods, and will be discharged through a cast-iron outfall to lower water, at such a time and state of the tide as will ensure the whole of the sewage being carried right out to sea with no possibility of its being returned. Most of the sewers will be constructed of cast-iron pipes supported on elm piles driven in on each side of the trenches, this precaution being necessary owing to the unstable and water-logged nature of the subsoil, and for the same reason most of the manholes will be constructed in cast-iron. All sewers are arranged with sufficient gradients, and all parts of the system will be efficiently flushed and ventilated. Provision is made for a moderate increase in the population. The Council approved of the scheme in its entirety, and gave instructions for the plans and estimates to be completed in accordance with the requirements of the Local Government Board, and forwarded to that body with a formal application for sanction of a loan, not exceeding 3,000*l.*, to carry out the work.

SEWER VENTILATION AT WOOLWICH.—A report of the Medical Officer, presented to the Borough Council at its last meeting, intimated that numerous complaints have been received during the past three months of offensive smells proceeding from the London County Council sewer ventilators. Most of these referred to manholes on premises in Station-road, Woolwich, which were supposed to be closed, but which the Woolwich inspectors' examinations showed were freely open. After repeated letters to the Chief Engineer of the London County Council they were satisfactorily closed. Other complaints referred to manholes in certain streets which had been closed by plates, but not sealed, so that sewer-gas was still able to escape. On this being pointed out to the Chief Engineer the manholes were sealed. Further complaints referred to shaft ventilators in Plumstead-road, at the mouth of which the Medical Officer of Woolwich has suggested that gas jets should be fixed, as in Webb's patent. This matter is under consideration.

THE WATER SUPPLY OF MONTROSE.—The Montrose Town Council are considering a report, prepared at their instance by Mr. J. B. Bennet, C.E., Edinburgh, regarding the burgh's water supply. The Local Government Board is insisting that the supply be increased and that a system of filtration be adopted. Mr. Bennet has prepared a scheme which, it is stated, would result in Montrose having, if required, a supply of 1½ million gallons per day. The expenditure he estimates at 10,500*l.*

WATER SUPPLY, INVERURIE.—On September 23 the scheme which for some time past has been in progress for the introduction to the Burgh of Inverurie of an augmented water supply was formally inaugurated. For some years past the Town Council have had under consideration the question of an augmented supply, and three years ago it was decided to proceed with a scheme with the source of supply at the farm of Mill of Eastertown. During the past six months the works have been completed, under the superintendence of Mr. G. G. Jenkins, C.E., Aberdeen. The source of supply at Mill of Eastertown is situated 6¾ miles from the Burgh of Inverurie. The gathering-grounds extend to 500 acres, in which collecting pipes have been laid at a considerable depth, no water being drawn at any point less than 10 ft. from the surface, and almost exclusively out of seamy rock. The entire supply is collected in a length of 700 yds. within the valley. The water is very bright and colourless, requiring no filtration, although screen tanks and filters are being introduced on a small scale at the source. The water is conveyed to the burgh in 8-in. diameter cast-iron pipes, and is delivered into an elevated tank recently constructed beside the existing Brandsbutt reservoir. The quantity of water is expected to augment the existing supply to 43 gallons per head per day of the present population of 4,500, or 30 gallons per head per day if the population increased by 50 per cent. The contract undertaken by Messrs. James Laing & Sons, Inverurie, amounted to 6,489*l.* With the collecting works, which the Town Council have themselves for the most part taken in hand, and also compensation works to farmers within the collecting area, there is a further probable expenditure of 1,000*l.*, which, together with surface damages, legal expenses, etc., brings up the total cost of the scheme to 9,000*l.* But to this has also to be added the sum of 3,000*l.* paid by the Corporation to Lord Leith of Fyvie as the purchase price of the farm of Mill of Eastertown.

Miscellaneous.

NEW MARKETS AND THE PUBLIC HEALTH ACT, 1908.—In a circular addressed to local authorities the Local Government Board call attention to sect. 166 of the Act (8 Edw. VII., c. 6), whereby urban district councils are now empowered to provide a market-place and to build a market-house with houses and places for cart-weighing, and with convenient approaches; the statute relates also to the purchase or leasing of land and of public and private rights in markets and tolls, whilst it enacts that no market shall be thus established so as to interfere with any existing privileges and rights enjoyed within the district by any person without his consent, and that the consent of owners and ratepayers of the district must be obtained for the exercise of powers under the section by an urban district council which is not a town council.

STREET INDICATORS TO PUBLIC BUILDINGS, ETC.—The Works Committee of the Kensington Borough Council has been considering the expediency of framing regulations under which indicating tablets may be attached to public lamps directing to public institutions, there being 396 such tablets already fixed. They have decided to recommend to the Council that permission should be granted for tablets to be fixed on lamp columns in suitable positions indicating the position of post-offices, fire stations and alarms, museums, hospitals, and railway stations. All tablets must be of the best material, and must be subject to the approval of the officers of the Council.

TREE PLANTING IN LONDON STREETS.—Several of the Metropolitan Borough Councils are considering the question of the planting of trees in their streets as a means of finding work for the unemployed. The Works Committee of Kensington Borough Council recommend that trees be planted in Raddington, Blagrove, Bevington, Silchester, and Bremley roads, and in Treverton and Rackham streets, and also that an additional number of trees be planted in Holland Park-avenue in continuation of those already existing in the thoroughfare. The Works Committee of the Camberwell Borough Council also recommend that, subject to satisfactory terms being arranged with the Local Government Board and the Central Unemployed Body, that a number of streets be planted with trees.

CAMBERWELL PAVING LOANS.—The Camberwell Borough Council have received a return from the London County Council with regard to paving loans. The return shows that several of the Metropolitan Borough Councils have succeeded in limiting their loans for paving works to a comparatively small total, while nine of them have refrained altogether from borrowing for this purpose during the period under review; but the County Council observe that the total amount for which the Camberwell Borough Council have obtained sanction in the period covered by the return is 52,956*l.*, an amount which is exceeded in the case of only one other metropolitan borough. Having regard to the advantages from a financial point of view of providing the costs of these works out of current rates, this Council are asked to take into consideration the desirability of so distributing their paving works in future as to dispense, if posible, with further loans for this purpose.

TWO HOMES OF ROMNEY AND HOOD.—Commemorative tablets have just been affixed at No. 17, Elm Tree-road, N.W., and the premises of the Constitutional Club, Hampstead. Thomas Hood lodged for a while during the interval 1842-3 in the house in St. John's Wood, where he wrote the "Song of the Shirt" for the Christmas, 1843, number of *Punch*, and, it seems, the "Bridge of Sighs" for his own magazine. He removed thence into a house which still stands in the Finchley-road. George Romney retired from his house (lately rebuilt) in Cavendish-square to Hampstead, where he stayed until he returned to his wife at Kendal. He first took country lodgings at Hampstead in 1788; in October, 1796, he bought the copyhold of the old red-brick house on "The Mount," in Heath-street. Three years afterwards, having sold his town house, he removed to premises in the rear which he had built, at a cost of 3,000*l.*, on Holly Hill, facing Holly Mount, including a picture and statue gallery—see the illustration in the *Builder* of July 25, 1868. In 1808, six years after his death, the house was taken for the Assembly or New Subscription Rooms. The premises of Romney's time then became the Holly Bush Tavern; the large timber-framed gallery or studio, upon a brick basement, which served for the assemblies, has latterly been occupied by the club. The club parlour, kitchen, and offices were, it appears, added about ninety years ago, by means of a tontine raised for an enlargement of the Subscription Rooms.

OPEN SPACES AND RECREATION GROUNDS.—The accounts of the Corporation of the City for last year show that 11,832*l.* were expended upon the maintenance of their open spaces, including Epping Forest (for which there is a deficiency of 2,283*l.*), Bunhill Fields, Burnham Beeches, Highgate Woods, and Coulsdon and West Wickham Commons.—Playing fields at North Acton have been secured at a cost of about 20,000*l.*; the 7-acres field, Plaistow, which the vicar of St. Mary's leased from the Gas Light and Coke Company, has been laid out and drained for games, recreation, and drilling; the Goldsmiths' Company have acquired the field at Mottingham for lease at a nominal rent to the London Playing Fields Society, who next year will open a cricket ground at Fairlop, in addition to those which have been made at Chingford and Wanstead Flats, and are maintained rent free by the Epping Forest Committee.—The acquisition of 30 acres at Gipsy-road, Norwood, is ensured by the additional subscriptions of Sir Ernest Tritton (800*l.*) and Lambeth Council (1,000*l.*), to complete the sum of 15,000*l.* required by the Ecclesiastical Commissioners as owners; the ground is part of the woods on the southern heights of London, and contains a curious old thatched cottage.—The Metropolitan Public Gardens Association have undertaken to lay out the garden of West-square, Southwark, as an open space, and the borough engineer has prepared a scheme for altering a carriage-way and inclosing about 30,000 ft. superficial of the ground.—Miss James, of Westdown, Hindhead, has just presented to the National Trust two tracts of inclosed heath land (66 acres) in that district. The one gift affords public access to the valley which joins Shottermill to the Huts on the main road to Portsmouth, lying in the beautiful surroundings of Frensham, Blackdown, and Marley, within the Surrey border; the other consists of the Chase on the verge of Bramshott Common, situated near Ludshott Common (recently secured for the Trust) at Headley, and near Weaver's Down, Selborne, and Empshott, in Hampshire.—The Birmingham Corporation have sold the George-road reservoir and 33 acres at Erdington, which the District Council will adapt as a recreation ground.—Miss Phear has given to the Exmouth U.D.C. 16 acres of Marpool Park, for use of the town, as a memorial of her parents.—Merthyr Tydfil Council have arranged with Mr. W. Crawshay to buy Cyfarthfa Castle and its park of 110 acres for, it is said, 14,500*l.*—A committee is formed for an exploration of Tara Hill, in Meath, with a view to the conversion of the district into a national park.

AN OLD INDUSTRY IN CANTERBURY.—A syndicate is about to be formed with the object of carrying on the weaving industry in Canterbury, which was revived there eleven years ago. Adjoining King's Bridge, by the stream of the Stour, is a fine old house called the Canterbury Weavers, wherein Miss E. F. Philpotts and Miss K. Holmes, with other ladies, established looms for the manufacture of cloths, linens, laces, muslins, carpets, and similar textile goods—the fabrics being of excellent workmanship. Their enterprise had its origin in a benevolent scheme, initiated by the ladies we mention, for giving employment and a livelihood to necessitous and crippled girls. The house itself is an interesting structure, having been built in 1571 upon foundations of *temp.* Stephen, which are carried down deep into the bed of the river. The gables were added by the Flemings, and the house was renovated in 1899. On the opposite bank of the stream stood the King's Mill, of which the co-eval foundations have remained to our own day. In Queen Elizabeth's reign the Walloons found refuge in Canterbury, and there they introduced the weaving of silks and stuffs. The place of worship assigned to them in the western and older part of the crypt of the cathedral was changed for the eastern portion, sometimes known as the Black Prince's Chantry, prepared for the Consistory of the French Protestant Church under directions of Sir Arthur Blomfield in 1895. King Charles II. granted a charter of incorporation in 1676 to the immigrant weavers, who were subsequently joined by refugees from France. The making of the famous "Canterbury muslin" has been lately revived.

HOLBORN (OLD) TOWN HALL.—The agreement is now ratified for the sale of these premises to Sir William Hartley, of Liverpool, at a price of, it is stated, 30,500*l.*, with 500*l.* for the organ and fittings. Sir William Hartley intends to devote the premises to uses of the Primitive Methodist Connexion with the option of purchase at the end of seven years, combined with the letting of the concert-hall, which has a capacity of 1,000 seats, for public meetings and religious services. The premises will be altered to meet their new purpose, and will be taken over at the end of the current year. The Town Hall was built at the corner of Clerkenwell and Gray's-inn roads after plans and designs of Mr. L. H. Isaacs (which were illustrated in our number of December 13, 1879), at a cost of some 60,000*l.*, including 18,000*l.* for the site of 12,000 ft. super. Messrs. Isaacs & Florence made some improvements and alterations subsequently, and a new staircase of grey and white marble, by Messrs. Farmer & Brindley, was constructed in 1890. In April, 1906, a bid at auction of 25,000*l.* was refused for the property, the reserve price being then fixed at 40,000*l.*

CENSUS OF PRODUCTION RETURNS.—In an official letter recently addressed by the Board of Trade to Sir Edward Fithian, Secretary of the Association of Chambers of Commerce, it is stated that the advisory committees appointed under the Act of 1906 have received nearly all of the 3,566 schedules sent out by them in respect of the coal and ironstone mining industries, and that so far they have received 1,100 of the 1,900 schedules issued to the iron and steel trades; similar progress is reported for the woollen, cotton, and worsted trades. Mr. H. W. Macrosty has been appointed Assistant Director of the Census of Production Department.

SWIFT'S HOME IN CHELSEA.—Mr. Randall Davies, F.S.A., of the Manhattan Club, New York, appeals for the rescue of a house which it appears is threatened with destruction in consequence of the contemplated re-erection of Crosby Place in Chelsea. Mr. Davies points out that some researches he has undertaken in the parish rate-books show that in 1711 Dean Swift lived, and wrote his journal to Stella, in the house which now stands at the south end, on the west side, of Danvers-street. We may add that Mr. Laurence Hutton, in his "Literary Landmarks of London," 1885, says that Swift's lodgings in 1711 at Chelsea were in Church-lane, now Church-street, "half-a-mile beyond Chelsea Church," and therefore, at the northern end, near Fulham-road. Both Danvers and Church streets satisfy Swift's own words in describing his daily walk thither—"and so to Chelsea, a little beyond the church." For his opposite neighbour he had Atterbury, Bishop of Rochester.

THE REPAIR OF RICHMOND CASTLE.—Some time ago, says the *Yorkshire Post*, the Archæological Societies of Yorkshire and Westmorland jointly approached the Board of Works on the question of the repair of the ruins of Richmond Castle, and requested the Board to undertake the work. A reply has been received stating that the request of the societies will be complied with. Richmond Castle was built in 1071 on the summit of a rock overlooking the River Swale, and was the centre of some of the most stirring scenes in Border warfare. William the Lion, King of the Scots, was imprisoned here on his defeat by the English army at Alnwick.

CHELSEA BOROUGH COUNCIL.—The London County Council Highways Committee have informed the Borough Council of schemes for tramways from Battersea Park to King's-road (in order to provide tramway communication across the river between Battersea and Chelsea), and tramways from Battersea Bridge to Shepherd's Bush. However, the Works and General Purposes Committee have decided that consent shall not be given to either of the proposals submitted by the London County Council for the introduction of tramways in the borough.——The French Asphalte Company, Ltd., is to be asked to maintain asphalt paving in King's-road on the same terms as at present, until wood-paving works are commenced there.——The London County Council is to be asked to grant the Borough Council a site in the garden on the Chelsea Embankment for the erection of a urinal.——Holbein-place cab-rank is to be lengthened and paved with granite setts.

SOUTHWARK BOROUGH COUNCIL.—An estimate of 250*l.* has been submitted to the Council for the reconstruction of a sewer in St. Gabriel-street.——Another estimate of 90*l.* has been passed by the Finance Committee for the reseating on Poulton blocks of two boilers at Manor-place Baths (36*l.*), and three boilers at Lavington-street Baths (54*l.*).——A sewer is to be relaid on private property at an estimated cost of 86*l.*——The Borough Council have received a letter from the Coroner for the City of London and Southwark, Dr. F. J. Waldo, expressing the opinion put forward by a jury in favour of the provision of refrigerator mortuary accommodation for unidentified bodies. The Public Health Committee, in a report, point out that the matter is one with which the London County Council alone can deal.——With regard to a proposal to effect a widening of East-street at its junction with the Walworth-road, the General Purposes Committee has resolved to go into the matter as to what buildings, or parts of buildings, it is necessary to acquire in order to carry out the improvement. Negotiations have taken place with the property owner, but up to the present nothing has been done in the matter.——The Borough Engineer estimates the cost of alterations, exclusive of fittings, etc., in order to provide accommodation at the Town Hall for the Superintendent Registrar for the Board of Guardians at 180*l.*

STATUE OF BOSWELL, LICHFIELD.—A statue of Boswell has been erected in the Lichfield Market. The statue is the gift of Mr. Percy Fitzgerald, by whom it was designed. It is of bronze, and the pedestal has on the top figures of Burke, Garrick, Goldsmith, Reynolds, and Mrs. Thrale, and beneath are three panels in high relief representing Johnson and Boswell walking in the Highlands, Boswell received at the Club and given a sermon by Johnson, and Boswell and Johnson supping at the Three Crowns at Lichfield.

PROPOSED STREET IMPROVEMENTS, NOTTINGHAM.—A Local Government Board Inquiry was recently held into the Nottingham City Council's application for sanction to borrow 22,000*l.* for the carrying out of the various street works. The work consists of the repaving of Alfred-street Central, Colwick-street, Cross-street, Platt-street, Huntingdon-street, Lincoln-street, part of Church-street (Old Basford), St. Peter's-street, and Windsor-street, with the necessary insertion of new gulleys and connexions; and the repaving and resewering of St. Michael-street. The City Engineer, Mr. A. Brown, supplied the necessary details of construction, etc. He said the work was not being done solely to relieve distress, but was on that account being carried out earlier than would otherwise have been the case.

POPLAR BOROUGH COUNCIL.—A licence has been obtained from the London County Council for carrying electric cables crossing the Blackwall entrances of the West India and South Docks, through the Cold Harbour and Isle of Dogs sewer. This will afford easier access to the cables, enable necessary repairs to be effected at a much less cost than at present, and ensure greater reliability in maintaining supply. The cost of the alterations is estimated at a little under 300*l.*——Two motor converters are to be rewound and repaired at an estimated cost of 80*l.*——It is to be suggested to the Central (Unemployed) Body for London that works be carried out to the amount of 6,100*l.*, to be divided almost equally between paving unpaved thoroughfares, and relaying existing paving, etc., and rolling macadam roadways.

DEPTFORD COUNCIL AND ARCHITECT'S FEES.—The Public Health Committee of Deptford Borough Council have had under consideration an account submitted by Mr. Horace T. Bonner, the architect of the mortuary and Coroner's Court, in respect of services rendered by him in connexion therewith. The designs of the building, prepared by Mr. Bonner, having been accepted, the Council appointed him architect, and agreed to pay him for such services a commission of 5*l.* per cent. upon the total cost of the buildings. The contract contained a provision that the total amount payable to the architect should not exceed 5 per cent. on the cost of the buildings, and for that purpose the expression "the cost of the buildings" was defined to mean the outlay incurred by the Council in respect of the work actually carried out, including permanent fittings, drainage, heating and ventilating apparatus, electric wiring, gas piping, fire-extinguishing apparatus, and water-supply appliances, but not including furniture or electric light or gas fittings. The contract further provided that the commission should be in full payment for all services rendered, and should include all the architect's office expenses in connexion with the building, and also the cost of plans, specifications, estimates, etc. Any dispute or difference was to be referred to the President of the Royal Institute of British Architects, whose decision was to be binding. The account rendered by Mr. Bonner amounted to 360*l.* 6*s.*, the principal item being in respect of his commission of 5 per cent. (206*l.* 1*s.* 6*d.*). Part of the difference between the two amounts was made up by charges for commission on permanent fittings amounting to 45*l.* 1*s.* 6*d.*, to which it was agreed Mr. Bonner was entitled, but the remainder was for extra works beyond those contemplated in the agreement, including altering, redesigning, and redrawing plans for the purpose of embodying suggestions made by the Chief Medical Officer of the Local Government Board, plans for London County Council, preparing electric light specifications, measuring up the work in detail and checking the accounts of the builder. The balance claimed by Mr. Bonner was, including the 45*l.* 1*s.* 6*d.* referred to, 154*l.* 4*s.* 6*d.*, and the Committee have been in negotiation with him in respect thereof. According to a report issued on Saturday, the Committee feel (and their opinion is substantiated by the advice of the solicitor) that some payment should be made, as they were enabled, through the measuring, etc., work done by Mr. Bonner, to dispense with the services of a quantity surveyor,

thereby effecting a saving. Mr. Bonner expressed his willingness to accept 60*l.*, in addition to the sum of 260*l.* 15s. 8d. already paid him, in full settlement, and the Committee has (subject to the usual sanction) accepted this.

FULHAM BOROUGH COUNCIL.—The Electricity and Lighting Committee of the Borough Council has resolved that an automatic time recorder be obtained as an experiment for checking the time of employees responsible for lighting and extinguishing the public street lamps (electric).——The Electricity Committee has under consideration the expediency of altering the lighting arrangements in Fulham Palace-road and High-street, which would involve a large initial expenditure. In the meantime the London County Council has consented to adapt the tramways standards to be erected in these roads for the purposes of public street lighting. This cost is not to exceed 18*l.*——The new Central Library building is sufficiently advanced for the foundation-stone to be laid, which ceremony Dr. Carnegie has been asked to perform on October 21.

ISLINGTON BOROUGH COUNCIL.—The Council has under consideration a communication from the London County Council notifying the latter body's intention to again apply for Parliamentary powers to construct a single line of tramways from Essex-road to Kingsland-road *viâ* Englefield-road.——A resolution is to be moved at the next meeting of the Borough Council in favour of 1,000*l.* being voted to the Trustees of Alexandra Palace for materials to enable them to carry out a scheme for completing the repairs at the Palace, and so giving employment to a considerable number of men.——At the last meeting of the Council, the Surveyor, replying to questions, stated that the cost of labour expended on the highways and footpaths of the borough for all the purposes of paving, picking, cleansing, and repairing for the year ended March, 1908, was 19,630*l.*, as compared with 23,843*l.* and 18,637*l.* for the same periods ending March, 1907, and March, 1906, respectively.——The Borough Treasurer stated that 71,914*l.* was the amount expended for the maintenance and repairs of highways, including scavenging and the repayment of instalment of loans and interest for 1907-8.——The carriageway of a part of Canonbury-square is to be paved with tar-macadam, at an estimated cost of 232*l.*

LEWISHAM BOROUGH COUNCIL.—The General Purposes Committee has resolved that high iron railings be erected at the churchyard of St. Mary's, Lewisham, early in the next financial year, at an estimated cost of 153*l.*——Subject to protective conditions, permission has been granted to the General Post Office for the erection of fire-alarm posts in ten positions, and to the South Metropolitan Electric Light and Power Company, Ltd., for the laying of a low-tension, concentric, lead-covered cable at Belmont Hill.

VICTORIA AND ALBERT MUSEUM.—With regard to the maintenance of the paving and footway in Cromwell-road adjoining the New Victoria and Albert Museum, the Kensington Borough Council has suggested to Sir Aston Webb, R.A., that a belt of grass might be laid along the Cromwell-road frontage of the museum instead of the whole area being paved as proposed. Sir Aston Webb has replied to the effect that this suggestion has already been discussed by the authorities, and, though many advantages were seen, it was thought on the whole that it would be better to pave the entire space as arranged, and an order had now been given for the paving work to be carried out.

KENSINGTON BOROUGH COUNCIL.—The Works Committee of the Kensington Borough Council have drawn up a lengthy report relative to the proposals of the London County Council to construct tramways from Battersea Bridge to Shepherd's Bush. Two alternative routes are suggested, viz., (1) from Battersea Bridge, *viâ* Cheyne-walk, Cremorne-road, Ashburnham-road, Tadema-road, Gunter-grove, Finborough-road, Warwick-road, and Holland-road to Uxbridge-road, with a single-line diversion *viâ* Edith-grove, Redcliffe-gardens, and Richmond-road; and (2) from Battersea Bridge, *viâ* Cheyne-walk, Cremorne-road, Ashburnham-road, Tadema-road, Gunter-grove, Finborough-road, Warwick-road, and Holland-road, to Uxbridge-road, with single-line diversion *viâ* Ifield-road and Adrian-terrace. Upwards of 700 persons have signed a petition against the proposals, pointing out that the roads are narrow and unsuitable for tramways, and Messrs. Drivers, Jones, & Co., on behalf of Lady Ilchester, owner of the Holland Park Estate, point out that Holland-road consists mainly of private residential houses of good class, and experience shows that they will be seriously depreciated by tramways. The Committee will recommend the Council not to give their consent to the proposed tramways.——An amended application on behalf of Harrod's, Ltd., to construct a subway connecting the main block of their premises with new buildings recently acquired on the north-east side of Hans-crescent, is to be granted.——The Metropolitan Electric Supply Company are to extend their mains to supply houses in Kensington Palace-gardens.——Painting work, estimated to cost 120*l.*, is to be carried out at the Kenley-street tenements.

HINE'S WAGE CALCULATOR.—We have received from "Hine's Patents, Ltd." (Glasgow), a description and illustrations of the "Hine's Wage Calculator," which calculates the value of any number of hours up to 100 by ¼-hours; also 200, 300, and 400 hours, at rates of from 4s. to 50s. per week, with extra keys for 3d., 6d., and 9d. per week, which enables calculations to be made at rates from 4s. to 50s. per week by intervals of 3d.

METROPOLITAN SEWERS AND DRAINS BILL.—Mr. A. Powal Coke, the Hon. Secretary of the Executive Committee of the St. Pancras Conference with regard to the Metropolitan Sewers and Drains Bill, has sent a letter to the Borough Councils stating that, although no satisfactory progress was made with this Bill during the last session of Parliament, Mr. Dickinson, M.P., proposed to again bring the Bill before the notice of the House of Commons during the autumn session. The experience of the last session only too plainly showed that without the co-operations of the responsible Minister of His Majesty's Government, there was little prospect of a private Member's Bill dealing with the difficulties created by the definitions of "sewer" and "drain" becoming law. He urges that the local authorities should approach the President of the Local Government Board to take over the Bill on behalf of the Government.

LEYTON URBAN DISTRICT COUNCIL AND THE APPOINTMENT OF QUANTITY SURVEYORS.—The Leyton Urban District Council, at its last meeting, agreed that, as the Local Government Board auditors insist in future that the appointment of a quantity surveyor shall be under seal, quotations be obtained from six or seven surveyors, to be nominated by the Chairman of the Education Committee and the architect, in connexion with proposed new schools. The Education Committee has the power to select and appoint.

LAMBETH BOROUGH COUNCIL.—Three new sewers are to be laid by Messrs. Stringer Brothers in new roads on an estate off Upper Tulse Hill. In order to take the drainage from the new roads on the estate it will be necessary for an existing 15-in. pipe sewer in Elm Park to be enlarged to a 24-in. pipe for a length of 200 ft. up from its junction with Brixton Hill. The estimated cost of the work is 500*l.*——The Highways Committee of the Borough Council has decided that the contract now existing with the Improved Wood Paving Company, Ltd., for wood-paving works in Cold Harbour-lane (7s. 1d. per yard) be extended to include the paving with wood of portions of the carriageways outside the track along the tramway route between Loughborough Junction and the West Norwood terminus, except so far as relates to the price, which for the latter work is to be 7s. per yard super.——Owing to difficulties which have arisen as to the construction to be placed upon certain conditions of the contract for the supply of York stone pavement, the contractors are to be relieved of their obligations, and the Council is to buy in the open market any further quantities of York stone paving which may be required during the current financial year.——In final settlement of the wood-paving contracts for Lower Kennington-lane, Tenison-street, and part of Waterloo-road, 535*l.* is to be paid to the Improved Wood Pavement Company, Ltd., which sum, equal to 10 per cent. of the contract figure, represents the retention money held by the Council for the twelve months during which the company was responsible for the maintenance of the wood paving laid in the carriageways of these three roads.——Application is to be made to the London County Council for a loan of 7,986*l.* for paving works in Milkwood-road, Norwood-road, and Herne Hill-road.

CAMBERWELL BOROUGH COUNCIL.—The Finance Committee of the Borough Council has resolved that a contract be entered into with Messrs. Fleere & Mills, Anchor Works, St. Anne's-row, Limehouse, for the supply and erection of polling-station fittings for a further period of five years.——Twenty-one tenders, ranging from 1,349*l.* 13s. 6d. (Messrs. E. Pavitt & Sons, Aveley and Purfleet, Essex) to 2,349*l.*, have been received for the erection of seven cottages in Pitman-street.—The Works Committee recommends, in a report just issued, that the estimate of the Borough Engineer, amounting to 1,500*l.*, be accepted.

PROPOSED HOSPITAL EXTENSIONS AT ACTON.—In a report concerning accommodation at Acton Isolation Hospital, Councillor E. F. Hunt, the Chairman of the Acton Health Committee, and Dr. D. J. Thomas, the Medical Officer of Health, propose a re-arrangement and an additional pavilion of thirty-six beds for scarlet fever cases. If the hospital be extended, the present administrative block will be inadequate, and the existing building is difficult, if not impossible, of extension; therefore, says the report, the Health Committee will probably have to decide between (*a*) taking down the present building and erecting a new administrative block; and (*b*) erecting a separate building for the accommodation of the increased staff. The former alternative, it is added, is worthy of serious consideration, as being ultimately the more economical and efficient course.

MOTOR FIRE-ENGINES. — Another self-propelled appliance for the London Fire Brigade has just been put into service. It is a petrol motor-escape van and combined "first aid" fire-engine, and is the first of three such machines ordered from Messrs. Merryweather & Sons. It can attain a speed of twenty miles an hour on the level, and is capable of negotiating any hill in the London district. The "first aid" cylinder, which is worked by compressed air, holds 35 gallons, and discharges through 180 ft. of special rubber hose coiled on a hydraulic reel.

WINGRAVE CHURCH, AYLESBURY. — Messrs. Percy Bacon & Brothers, of London, have just executed and fixed in this church a three-light stained-glass window. The centre light contains the "Crucifixion," with St. Mary and St. John in the two side lights; angels holding scrolls with texts appear in the tracery.

BACON AND GRAY'S-INN.—On next Saturday the Benchers will entertain a party of guests in the Inn to celebrate the anniversary of Bacon's election as their Treasurer on October 17, 1608, he being their Solicitor-General. He promoted the formation of the garden, lately opened to view from Theobalds-road, and began the laying out of the walks and the planting of the trees, mostly elms, in, it seems, 1597; he built a summerhouse by the hedge on the mount in memory of his friend Jeremy Bentham, and planted, it is said, the catalpa-tree which is living yet.

Capital and Labour.

GLASGOW PLUMBERS' DISPUTE.—A conference between representatives of the operative plumbers of Glasgow and the masters was held on the 1st inst., when, after discussion, an amicable arrangement was arrived at regarding the points in dispute, and it was agreed that the lockout notices should be withdrawn. This arrangement was submitted to a meeting of the men and approved.

Patents of the Week.

APPLICATIONS PUBLISHED.*

18,119 of 1907.—E. F. HASSART: *Glazing.*
This relates to glazing of the kind in which grooved or ribbed metal bars are covered with lead capping, and consists in the use of spring clips which press against the lead capping over the metallic bar, and also press or hold against the edges of the capping over the glass. The metallic bars used in making lead capping for supporting glass roofing are made with a centre ridge and side ridges. The lead capping is fixed over metallic bars which are grooved or ridged by means of rollers, which press the capping over the ridges or into the grooves. The rollers are arranged on a frame in such a manner that by running or pushing the frame over capping along the bars the capping will be pressed into position on the bars and over the glass.

20,132 of 1907.—G. B. BROWN: *Hot-water Supply Apparatus.*
This relates to hot-water apparatus, and consists in the superimposing or locating of the hot-water cylinder or reservoir upon or in contact with the range boiler, and so as to extend into the chimney flue, in which position it is acted upon directly by the heated gases from the fire.

21,929 of 1907.—H. S. HOLDSWORTH, A. S. HOLDSWORTH, and P. F. HOLDSWORTH: *Boilers for Domestic and Heating Purposes.*
This relates to hot-water boilers for heating and domestic purposes, and comprises the combination of an iron hot-water boiler or section and a copper hot-water boiler or section, the copper section fitting within the waterway of

* All these applications are in the stage in which opposition to the grant of patents upon them can be made.

PATENTS.—*Continued on page 387.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxviii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bond-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

***** It must be understood that the following paragraphs are printed as news, and not as advertisements: and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.**

Competitions.

NOVEMBER 14.—**Whitehaven.**—PUBLIC ELEMENTARY SCHOOL.—Whitehaven Education Committee invite from architects practising exclusively in Cumberland or resident therein, or whose head office has been located in Cumberland since January, 1907, designs (sketch-plans only) and estimates for a new public elementary school and caretaker's cottage, to be erected in Whitehaven, to accommodate 700 scholars (500 mixed and 200 infants). Plan of site and conditions may be obtained on application to Mr. W. D. P. Field, Secretary, Town Hall, Whitehaven.

* DECEMBER 10.—FERRO-CONCRETE.—Designs for the architectural treatment of a building constructed in ferro-concrete. See advertisement in this issue for further particulars.

* DECEMBER 19.—**Preston (Lancs).**—ADDITIONS TO ASYLUM.—The Committee of Visitors for the County Asylum at Whittingham, near Preston, invite designs, etc., for a new annexe or asylum estate. See advertisement in this issue for further particulars.

* NO DATE.—**Cornwall.**—NEW COUNTY OFFICES.—The Cornwall C.C. invite competitive designs and estimates for new County Offices. See advertisement in last issue for further particulars.

Contracts.

BUILDING.

OCTOBER 12.—**Bradford.**—EXTENSION OF COOKING DEPOT.—The Education Committee invite tenders for the various tenders required in the extension of the cooking depôt at Green-lane School. Drawings, etc., may be seen, and bills of quantities and form of tender obtained, on application at the office of the City Architect, Whitaker-buildings, Brewery-street, Bradford.

OCTOBER 12.—**Heeley.**—RECONSTRUCTION AND ADDITIONS.—Reconstruction and additions to the Meersbrook Tannery Estate, Heeley, Sheffield. Names to Messrs. Empsell & Clarkson, architects, Exchange-buildings, Bradford.

OCTOBER 12.—**Hull.**—SCHOOL.—The Education Committee of the Corporation invite tenders for the erection of an infants' school, Craven-street. Drawings, etc., may be seen at office of Mr. Joseph H. Hirst, City Architect, Town Hall, Hull, and quantities obtained upon a deposit of 2*l.* 2s..

OCTOBER 12.—**Sedgefield.**—ALTERATIONS, ETC.—Tenders are invited for the alterations and additions to two houses in Front-street, Sedgefield. Plans may be seen, and specifications obtained, any night between 5.15 and 6.15 o'clock, and on Saturday after 1.30 p.m., on depositing cheque for 10s. Mr. T. W. Thubron, Front-street, Sedgefield.

OCTOBER 14.—**Chorlton-cum-Hardy.**—STABLE BUILDINGS.—Manchester Corporation Withington Committee invite tenders for the several works required in the erection of a twelve-stalled stable, loft, cart sheds, outbuildings, and boundary wall at the Refuse Destructor, Nell-lane, Chorlton-cum-Hardy. The drawings, etc., may be seen, and bill of quantities and form of tender may be obtained, at the office of the Surveyor to the Committee, Town Hall, West Didsbury, on payment of a deposit of 1*l.*

OCTOBER 14.—**Gillingham.**—VESTRY HALL REPAIRS.—The Overseers of the Poor invite tenders for repairs, etc., to the Vestry Hall, Church-street, Gillingham. Specifications can be seen at office of Mr. J. W. Peachell, Vestry Clerk, Vestry Clerk's office, Gillingham.

OCTOBER 14.—**Hayes.**—RE-ERECTION OF IRON HOSPITAL BLOCK.—Uxbridge Joint Hospital Board invite tender for the re-erection of iron hospital block at their Small-pox Hospital, Yeading-lane, Hayes, Middlesex. A specification and plan can be viewed at the office of the Board's Architect, Mr. William L. Eves, 54, High-street, Uxbridge.

OCTOBER 14.—**Nottingham.**—SCHOOL ALTERATIONS.—City of Nottingham Education Committee invite tenders for proposed alterations to chemical and physical laboratories and the conversion of existing gymnasium into chemical laboratory, at High Pavement Secondary School, Stanley-road. Plans may be seen at, and copies of the bill of quantities and form of tender obtained from, the office of the City Architect (Mr. Frank B. Lewis), Guildhall, on payment of a deposit of 2*l.* 2s.

OCTOBER 14.—**Saunderton.**—STRONG ROOM, ETC.—Wycombe Board of Guardians invite tenders for the construction of a small strong room at the Workhouse, Saunderton, and for repairs to the foundation walls of the infectious ward adjacent to the Workhouse. Plan and specifications can be seen at the office of Messrs. Hooper & Nash, Church-square, High Wycombe, between 10 a.m. and 4 p.m.

OCTOBER 14.—**Warcop.**—EXTENSIONS.—Tenders are invited separately or for the whole of the artificers' works required in building extensions and other work to Warcop Hall, Westmorland, for Mr. J. A. Wild. Plans and specifications can be seen, and bills of quantities obtained, upon application at office of Mr. Stephen Shaw, F.R.I.B.A., architect, Kendal.

OCTOBER 14.—**Wigan.**—WEIGHING MACHINE OFFICE AND CONVENIENCES.—The Corporation of Wigan invite tenders for the erection of sanitary conveniences and weighing machine office, near the Market Hall, Wigan. Plan, specification, and other particulars can be obtained at the office of the Borough Engineer, King-street West.

OCTOBER 15.—**Darlington.**—ADDITIONS, ETC.—The Guardians invite tenders for the whole of the various works required to be done in the additions and alterations to their offices. Drawings etc., may be inspected, and bills of quantities obtained, at the offices of the architects, Messrs. Hoskins & Brown, Court-chambers, Darlington.

OCTOBER 15.—**King's Langley.**—BALCONY.—St. Pancras Guardians invite tenders for the erection of a small open-air balcony at their schools at Leavesden, near King's Langley, Herts, in accordance with drawings and specification, which may be seen at the offices of their surveyors, Messrs. W. T. Farthing & Son, 46, Strand, London, W.C., between 10 a.m. and 4 p.m., and from whom copies of the bill of quantities can be obtained on deposit of 1*l.* 1s.

OCTOBER 17.—**Kingussie.**—VILLAS.—Estimates are wanted for mason, carpenter, slater, plumber, plasterer, painter, and glazier works of two large villas to be erected on West-terrace. Plans and specifications may be seen with the architect, Mr. Alexander Mackenzie, C.E.

OCTOBER 17.—**Leeds.**—TRANSFORMER CHAMBER.—The Leeds Corporation invite tenders for the erection of a transformer chamber (overground) in East-street, Leeds, for the Electric Lighting Department. Specifications, plans, etc., may be seen, and forms of tender obtained, on application to Mr. H. Dickinson, Manager of the Department, 1, Whitehall-road, Leeds.

OCTOBER 17.—**Monmouth.**—SCHOOL REPAIRS, ETC.—Monmouthshire Education Committee invite tenders for carrying out:—(1) Extensions and alterations, new playgrounds, etc., at the Tynewydd Council School, Newbridge; (2) asphalting playgrounds, matchboarding, ceilings, etc., to the Troedrhiwgwair Council School; (3) asphalting playgrounds at Garnyrerw Council School, Blaenavon; (4) blocking floors at St. Dials Council School, Cwmbran; (5) repairs at Pontllanfraith Council School. Plans, etc., can be seen at the offices of Mr. C. Dauncey, Secretary, County Council Offices, Newport, Mon.

OCTOBER 19.—**Armagh, etc.**—COTTAGES, ETC.—The Directors of the Great Northern Railway Company (Ireland) invite tenders for the following:—Two four-roomed gatekeepers' cottages, in masonry, between Armagh and Keady; masonry tank house at Keady; one four-roomed gatekeeper's cottage at Drumclay Crossing, near Enniskillen. Drawings and specifications may be seen at the office of Mr. W. H. Mills, Engineer-in-Chief, Amiens-street Terminus, Dublin, or copies of them at the office of the District Engineer, Belfast, where forms of tender can be obtained on payment of 1s. each (not returnable).

OCTOBER 19.—**Bangour.**—GREENHOUSE EXTENSION.—The Edinburgh District Board of Lunacy invite offers for the works required on the extension of the greenhouse at Bangour. Plans, etc., may be obtained on application to the architect, Mr. Hippolyte J. Blanc, R.S.A., 25, Rutland-square, Edinburgh.

OCTOBER 20.—**Cornsay Colliery.**—SCHOOL, ETC.—C.C. of Durham invite sole tenders for (1) new infants' school at Cornsay Colliery, and (2) alterations to the present school. Plans, etc., may be seen, and bills of quantities obtained, at the office of the County Education Architect, Shire Hall, Durham.

OCTOBER 23.—**Glanton.**—LATRINES.—The Managers invite tenders for work to be done in demolishing existing offices, and erecting new latrines, etc., at Glanton Schools. Plan, etc., are deposited with the schoolmaster at the School House, Glanton. Mr. H. W. Walton, Clerk to the Managers, Fenkle-street, Alnwick.

* OCTOBER 23.—**London.**—EXTENSION TO LAW COURTS.—The Commissioners of H.M. Works and Public Buildings invite tenders for extensions to the Royal Courts of Justice. See advertisement in this issue for further particulars.

OCTOBER 24.—**Norwich.**—SECONDARY SCHOOL.—Tenders are invited for the erection of a secondary school, with alterations to existing buildings, at Eaton-road. Personal application must be made at the offices of Mr. C. J. Brown, architect and surveyor, Cathedral Offices, The Close, to inspect the drawings, specification, etc., after which form of tender, etc., can be obtained at the City Accountant's Office, Municipal Buildings, upon depositing Bank of England notes of the value of 25*l.*

* OCTOBER 28.—**Laindon.**—ADDITIONS.—The Guardians of Poplar invite tenders for erecting iron buildings and making additions, etc., to existing buildings and other works at Laindon Branch Workhouse, Essex. See advertisement in this issue for further particulars.

* NOVEMBER 14.—**Brentwood.**—ADDITIONS TO ASYLUM.—The Visiting Committee of the Essex County Lunatic Asylum invite tenders for a new central kitchen, etc., at Brentwood Asylum. See advertisement in this issue for further particulars.

NO DATE.—**Bradford.**—WHEELWRIGHT'S WORKSHOPS.—Tenders are invited for new wheelwright's workshops, in Bowland-street, Bradford. Plans may be seen, and quantities obtained, on application to Mr. H. Hardaker, architect, Ivegate-chambers, New Ivegate, Bradford.

NO DATE.—**St. Mary's.**—HOUSE.—Tenders are invited for building a large house at St. Mary's, Isles of Scilly. Plans and specification to be obtained from Mr. F. Tonkin, "Fernleigh," Isles of Scilly.

ENGINEERING, IRON, AND STEEL.

OCTOBER 12.—**Salford.**—STEAM-FEED PLANT.—The Electricity Committee of the Salford Corporation invite tenders for the supply and delivery at the Corporation Electricity Generating Station, Frederick-road, Salford, of the following plant:—Specification No. V. 23, vertical steam-feed pumps. Specification and form of tender may be obtained from Mr. Victor A. H. M'Cowen, M.Inst.E.E., the Borough Electrical Engineer, Frederick-road, Pendleton, on payment of a deposit of 1*l.* 1s.

OCTOBER 13.—**Leeds.**—TRAMWAY MATERIALS.—The Tramways Committee of the Leeds Corporation invite tenders for the supply of material necessary for the construction of tramway between Horsforth and Guiseley. Specifications and forms of tender may be obtained on application at the Tramways Office, Mr. J. B. Hamilton, General Manager, City-square, Leeds.

OCTOBER 14.—**Plymouth.**—CAST-IRON PIPES.—Plymouth Corporation (Waterworks) invite tenders for the supply and delivery of about 600 yds. of 9-in., 1,000 yds. of 6-in., and 3,000 yds. of 4-in. cast-iron pipes. Specification and form of tender and other information may be obtained at office of Mr. Frank Howarth, M.Inst.C.E., Water Engineer, Municipal-buildings, **Plymouth.**

OCTOBER 17.—**Stockport.**—VALVES, SLUICES, ETC.—The Corporation invite tenders for the supply of valves, pipes, sluices, miscellaneous ironwork, etc., required in connexion with the Kinder Reservoir. Drawings can be seen, and copies of specification obtained, at offices of Messrs. G. H. Hill & Sons, civil engineers, Albert-chambers, Albert-square, Manchester, and 3, Victoria-street, Westminster, upon receipt of cheque for 1*l.* 1s. A limited number of sets of the drawings, uncoloured, are available, and will be lent to persons tendering in priority of application on receipt of the sum of 2*l.* 2s., which sum will not be returned.

OCTOBER 20.—**London.**—WHEELS AND AXLES.—The Secretary of State for India in Council invites tenders for the supply of wheels and axles. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W.

OCTOBER 21.—**London.**—POINT AND SIGNAL FITTINGS.—London, Brighton, and South Coast Railway Company Directors invite tenders for the supply of point rod, trestles, levers, wheels, pulleys, disc signals, signal lamps, cranks, and other cast and forged point and signal fittings. The conditions of contract and forms of tender can be obtained, and patterns inspected, upon application to the Company's Storekeeper, Mr. P. J. Baldwin, New Cross, S.E., and upon payment of the sum of 1*l.*, one half of which will be returned.

OCTOBER 22.—**Goole.**—BRIDGE WORKS.—The Directors of the North-Eastern Railway invite tenders for the construction and sinking of the bed of the River Ouse of a cast-iron casing cylinder (about 55 tons) for a new accumulator, and the construction of an accumulator house, etc., at Goole Swing Bridge. Plans may be seen, and specification, etc., obtained, on personal application at the office of Mr. W. J. Cudworth, the Company's Engineer, at York.

MISCELLANEOUS.

OCTOBER 12.—**East Preston.**—CARTAGE OF FLINTS.—East Preston R.D.C. invite tenders for carting flints. Tender forms to be obtained from Mr. Arthur Shelley, Clerk to the Council, Littlehampton.

OCTOBER 12.—**East Preston.**—STEAM ROLLING.—East Preston R.D.C. invite tenders for steam rolling

upon the roads throughout their district. Tenders, stating weight of roller and other particulars, with price per day inclusive, to be sent to the Chairman of the R.D.C., Board-room, East Preston.

OCTOBER 12.—**Kingston.**—FURNITURE.—The Guardians of the Kingston Union invite tenders for the supply of furniture. Particulars of what is required can be obtained upon personal application to the Steward of the Infirmary, London-road, Kingston Hill.

OCTOBER 12. — **Steyning.** — STEAM ROLLING. — Steyning East R.D.C. invite tenders for the hire of a steam road roller for about ten weeks. Mr. Arthur Flowers, Solicitor, Clerk to the Council, Union Offices, New Shoreham.

OCTOBER 13. — **Swimbridge.** — STORAGE TANK. — Barnstaple R.D.C. invite tenders for the construction of a small storage tank in connexion with Swimbridge Water Supply. Quantities, etc., may be seen at the office of the surveyor, Mr. Eric G. Kingwell, 85, Routport-street, Barnstaple.

OCTOBER 13. — **Withington.** — PLASTERING. — The Guardians of the Chorlton Union invite tenders for the plastering of the walls of the Cottage Hospital at the Withington Workhouse. Specifications may be obtained at the offices of Messrs. Charles Clegg & Son, architects, 31, Spring-gardens, Manchester, upon payment of 1*l.* 1s.

OCTOBER 14.—**London.**—HIGH-SIDED WAGONS.—The Crown Agents for the Colonies, acting on behalf of the Government of Southern Nigeria, invite tenders for the supply of fifty 36-ft. high-sided wagons. Forms of tender and all particulars may be obtained on application at the office of the Crown Agents for the Colonies, Whitehall-gardens, London, S.W., between 10 a.m. and 4 p.m. (Saturdays 10 a.m. to 1 p.m.) on payment of a deposit of 1*l.*

OCTOBER 15.—**Rochdale.**—COPPER CABLE.—The Guardians invite tenders for the erection of an overhead bare copper cable at their Workhouse. Specifications, etc., to be obtained from Mr. R. A. Leach, Union Clerk, Union Offices, Rochdale.

OCTOBER 21. — **Billinge.** — BORING FOR WATER. — Wigan Guardians invite tenders for boring for water at Green Slate Farm, Billinge, near Wigan. Separate tenders to be made for 4-in. diameter and 6-in. diameter holes, and prices to be given per yard up to a depth of 50 yds., 75 yds., and 100 yds. For further information apply to Mr. Henry Ackerley, Clerk, 9, Victoria-buildings, King-street, Wigan.

OCTOBER 21.—**Hastings.**—TIMBER.—Education Committee invite tenders for the supply of timber to the Technical Schools for the year 1909. Form of tender giving particulars of quantities required may be obtained at the offices of the Committee. Mr. Philip O. Buswell, Clerk of the Committee, 18, Wellington-square, Hastings.

OCTOBER 26.—**Penyrheol.**—FURNITURE.—Caerphilly U.D.C. invite tenders for furniture, etc., for Infectious Diseases Hospital, Penyrheol. Forms of tender, with conditions attached, may be obtained from Mr. William Spickett, Clerk, Council Offices, Caerphilly.

✱ OCTOBER 28. — **Gravesend.** — FURNITURE. — The Gravesend Education Committee invite tenders for furniture (desks, tables, etc.) for new schools at Cecil-road, Gravesend. See advertisement in this issue for further particulars.

PAINTING, etc.

OCTOBER 17.—**Cardiff.**—PAINTING.—Cardiff Guardians invite tenders for internal painting, etc., at the Cardiff Workhouse, according to specification, a copy of which, together with the form of tender, may be obtained from Mr. Arthur J. Harris, Clerk, Union Offices, Queen's-chambers, Cardiff.

OCTOBER 19.—**Liverpool.**—PAINTING.—The Select Vestry of Parish of Liverpool invite tenders for the painting of the exterior wood and iron work of their Brownlow-hill Buildings, and for the internal painting of the Workhouse Church and the Parish Offices. Specification may be seen, and all necessary information may be had, at the Parish Offices, Brownlow-hill. Mr. H. J. Hagger, Vestry Clerk.

✱ NOVEMBER 4.—**Hampstead.**—CLEANING AND PAINTING.—The Guardians of the parish of St. John's, Hampstead, invite tenders for cleaning and painting works. See advertisement in this issue for further particulars.

ROADS, SANITARY, AND WATER WORKS

OCTOBER 12.—**Leeds.**—PAVING AND FLAGGING.—Leeds Highways Committee invite tenders for the paving and flagging of Nowell-walk, Nowell-parade, etc. Drawings may be seen at the City Engineer's office, Municipal Building, and forms of tender, etc., may be obtained on application at the Highways Office, 155, Kirkstall-road.

OCTOBER 12.—**Lumb Clough and Triangle.**—MAIN SEWERS, ETC.—The execution of about 5,000 yards of main sewers in the bed of the river Ryburn, Lumb Clough, and along the turnpike road at Triangle, and for the supply of about 3,000 yds. of iron pipes and special castings for the Sowerby U.D.C. Names to the engineers, Messrs. Utley, Hebblethwaite, & Utley, 10, Waterhouse-street, Halifax. A deposit of 2*l.* 2s. will be required for the bills of quantities.

OCTOBER 13.—**Leeds.**—EXCAVATING, PAVING, ETC.—The Tramways Committee of the Leeds Corporation invite tenders for the excavating, concreting, and paving of about four miles of double tramway track in the urban districts of Horsforth, Rawdon, Yeadon, and Guiseley. Specification and forms of tender may be obtained on application at the Tramways Office. Mr. J. B. Hamilton, General Manager, City-square, Leeds.

OCTOBER 13.—**Swansea.**—SEWER.—The Corporation invite tenders for the construction of about 870 lin. yds. of brick and concrete sewer, partly 5 ft. and partly 4 ft. diameter, laid complete, together with the manholes, junctions, and other works in connexion therewith. Drawings, etc., may be seen at the office of the Borough Engineer, Guildhall, Swansea, from whom schedule of quantities and form of tender can be obtained, on payment of 1*l.* 1s.

OCTOBER 14. — **Barrow-in-Furness.** — STREET WORKS.—The Corporation invite tenders for the construction of back Hindpool-road and back Highfield-road. Bills of quantities, forms of tender, and further particulars may be obtained upon application at the Borough Engineer's Office, Town Hall.

OCTOBER 14.—**St. Germans.**—DRAIN PIPES, ETC.—The St. Germans R.D.C. invite tenders for providing and laying about 140 ft. of 6-in. land drain pipes and building a manhole at Tideford, St. Germans. Plan and specifications of the work may be seen at the office of Mr. Fred. Et. Cleverton, Clerk, 4, Buckland-terrace, Plymouth.

OCTOBER 14. — **Thirsk.** — WATER SUPPLY.—Thirsk R.D.C. invite tenders (Contract No. 1) for providing and laying about 2,400 lin. yds. 4-in. and 3-in. cast-iron pipes, together with the necessary valves, hydrants, and standposts, etc., also the construction of a small covered service reservoir, and collecting chamber, etc. Plans and specification may be inspected at the office of the engineers, Messrs. Spinks & Pilling, 20, Park-row, Leeds, from whom bills of quantities and form of tender may be obtained on payment of a deposit of 2*l.* 2s.

OCTOBER 15. — **Cork.** — SEWERAGE WORKS. — Cork R.D.C. invite tenders for supplying and laying the necessary sewer pipes at The Lough, Pouladuff, College, Glasheen, and Magazine roads, and constructing clarifying tank, etc., according to plans and specification, which may be inspected at office of Mr. John Cotter, Clerk of Council, Board-room, Workhouse, Cork. A copy of bill of quantities, prepared by Council's engineers, may be obtained on payment of 2*l.*

OCTOBER 15. — **Cork.** — WELL SINKING, ETC. — Cork R.D.C. invite tenders for execution of the following works, according to specifications, which may be inspected at the Board-room, Cork Workhouse, viz.: (*a*) Sinking well, supplying and erecting pump at Rathpeacon; (*b*) sinking well, supplying and erecting pump at Kilmap; (*c*) sinking well, supplying and erecting pump at Newtown, near Queenstown; (*d*) covering sewer at Church Hill, Passage West. Tender forms may be obtained on application.

OCTOBER 15.—**Croydon.**—PRIVATE STREET WORKS.—Croydon R.D.C. invite tenders for the execution of private street works:—Parish of Beddington—Beddington-grove. Parish of Mitcham—Devonshire-road West, Rutland-road. Parish of Sanderstead—Sanderstead-hill East, Sanderstead hill West. Hamlet of Wallington—Beddington-gardens, Holmwood-gardens. Plans, etc., prepared by the Council's Surveyor, Mr. R. M. Chart, F.S.I., can be inspected, and forms of tender obtained, at his office, Town Hall, Croydon, on payment of 5*l.*

OCTOBER 16.—**Bexhill.**—STREET WORKS.—The Bexhill Corporation invite tenders:—(*a*) For making-up Sutherland-avenue (length about 1,830 ft.) under Private Street Works Act; (*b*) for laying down about 3,250 yds. super. of tar macadam in Sackville-road. Plans may be seen, and specifications, etc., obtained, upon application to the Borough Surveyor, Mr. George Ball, A.M.Inst.C.E., Town Hall, upon payment of 1*l.* 1s.

OCTOBER 16. — **Chadderton.**—FILTERS, ETC.—Chadderton U.D.C. invite tenders for the construction of twenty-three bacterial filters, storm filters, sedimentation tanks, etc. Drawings and specification may be seen, and quantities, form of tender, and all other particulars obtained, on application at the offices of Messrs. James Diggle & Son, civil engineers, Hind Hill-street, Heywood, on and after September 28, 1908, on payment of a sum of 2*l.*

OCTOBER 17.—**Reading.**—PRIVATE STREET WORKS—The Urban Sanitary Authority invite tenders for making-up streets. The drawings may be seen, and a copy of the general conditions, specifications, etc., obtained, on application at offices of Mr. John Bowen, A.M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Reading.

OCTOBER 19.—**Derby.**—WATER SUPPLY.—Derby Corporation Waterworks Committee invite tenders for carting, laying, and jointing cast-iron mains from Uttoxeter-road, opposite the Derby Workhouse, to the County Asylum at Mickleover, consisting of about 2½ miles of pipes, together with the necessary valves, hydrants, etc. Plans, etc., may be seen, and printed specification, etc., obtained, at the offices of Mr. John Ward, M.Inst.C.E., Borough Surveyor and Waterworks Engineer, Borough Surveyor's Office, Babington-lane, Derby, on deposit of 1*l.* 1s.

OCTOBER 19.—**Dover.**—ROAD MATERIALS.—The T.C. invite tenders for the supply and delivery of road materials. Forms of tender and specification may be obtained at the office of Mr. R. E. Knocker, Town Clerk, Town Clerk's Office, Castle Hill House, Dover, during office hours.

✱ OCTOBER 20.—**Boreham Wood.**—ROAD-MAKING. The Barnet R.D.C. invite tenders for material and labour involved in making-up certain roads. See advertisement in this issue for further particulars.

OCTOBER 24.—**Dorking.**—SEWER.—Dorking U.D.C. invite tenders for the construction of an extension sewer in St. Paul's-road, Dorking, about 311 yds. of 9-in. stoneware pipes, manholes, and flushing tank, etc. Plan, etc., and form of tender may be seen daily at the Town Surveyor's office, 64, South-street.

OCTOBER 28.—**Blaydon-on-Tyne.**—STREET WORKS.—The Blaydon U.D.C. invite tenders for making-up part of Railway-street, Blaydon-on-Tyne. Plans, etc., may be seen, and quantities and form of tender obtained, on application to the Surveyor, Mr. George Symon, upon payment of 1*l.*

✱ OCTOBER 28.—**Hampstead.**—ROAD REPAIRS.—The Metropolitan Asylums Board invite tenders for repairs to roads at North-Western Fever Hospital, Lawn-road, Hampstead, N.W. See advertisement in this issue for further particulars.

✱ OCTOBER 28. — **Woolwich.** — TAR PAVING. — The Metropolitan Asylums Board invite tenders for tar paving work at Brook Fever Hospital, Shooters Hill, Woolwich, S.E. See advertisement in this issue for further particulars.

STONE, MATERIALS, AND STORES.

OCTOBER 12.—**Sheerness.**—GRANITE SETTS AND CHANNEL.—Sheerness U.D.C. invite tenders for the supply of (1) 60 tons of Norwegian granite setts, 4 in. wide, 6 in. deep, in random lengths; (2) 200 yds. 5 in. by 12 in. Norwegian granite channel in lengths not less than 3 ft. Forms may be obtained from Mr. Vincent H. Stallon, Clerk of the Council, Council Offices, Trinity-road, Sheerness.

OCTOBER 13. — **Waterloo.** — PIPES.—The U.D.C. of Waterloo-with-Seaforth invite tenders for about 380 yds. of stoneware or fireclay sewer pipes, 2 ft. 3 in. diameter, with spigot and socket joints. Specifications and further particulars may be obtained on application to Mr. F. Spencer Yates, A.M.Inst.C.E., the Surveyor to the Council, at the Town Hall, Waterloo, near Liverpool.

OCTOBER 14. — **Twickenham.** — PIT FLINTS. — Twickenham U.D.C. invite tenders for the supply of brown Kentish pit flints. Form of tender and specification may be obtained on application to Mr. Fred. W. Pearce, F.S.I., Surveyor to the Council, Town Hall, Twickenham.

OCTOBER 16. — **Sheffield.** — IRONMONGERY.—Sheffield Education Committee invite tenders for the supply of ironmongery for repairs, etc., which will probably be required during the ensuing year. Forms of tender may be obtained on application at the Education Committee's Office any time up to October 14.

OCTOBER 19. — **Bristol.** — STONE FOR MACADAMISED ROADS.—The Sanitary and Improvement Committee of the City Council invite tenders for the supply of stone for macadamised roads. A copy of the specification and form of tender may be obtained at the office of Mr. Thos. Henry Yabbicom, City Engineer and Surveyor, 63, Queen-square, Bristol, on payment of 10s.

OCTOBER 20. — **Glyncorrwg.** — MATERIALS.—Glyncorrwg U.D.C. invite tenders for the supply of materials. Particulars and forms of tender, together with any other information required, may be obtained upon application to Mr. W. P. Jones, Surveyor, Council Offices, Cymmer, Port Talbot.

OCTOBER 22.—**Bishop's Stortford.**—GRANITE.—The U.D.C. invite tenders for the supply of not less than 1,200 tons of 2½-in. and 1¾-in. broken granite, and not less than 120 tons of ½-in. granite chippings. Forms of tender can be obtained on application to Mr. Thos. Swatheridge, Clerk, Council Offices, 7, North-street, Bishop's Stortford.

OCTOBER 27.—**Belfast.**—STORES.—The Belfast Harbour Commissioners invite tenders for the supply of stores, etc. Forms may be obtained on application to the Harbour Engineer, Mr. W. Redfern Kelly, Harbour Office, Belfast.

OCTOBER 27.—**Sheppey.**—RAG STONE AND PIT FLINTS.—Sheppey R.D.C. invite tenders for the supply of blue rag stone and pit flints (quantities likely to be required being 1,220 yds. of blue rag stone and 370 yds. of pit flints). Forms of tender, upon which all tenders must be made, can be obtained on application to Mr. John Copland, Clerk, Sheerness.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
•TEMPORARY DRAUGHTSMAN	Hackney Borough Council ...	2*l.* 10s. per week	Oct. 20
•BOROUGH SURVEYOR	Deptford Borough Council ...	350*l.* per annum	Oct. 23
•DEPUTY BOROUGH SURVEYOR	Brighton Town Council	250*l.* per annum	Oct. 31

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
•NURSERY STOCK, SOUTH WOODFORD—On the Premises	Protheroe & Morris	Oct. 13
•DEALS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sims	Oct. 14
•FREEHOLD BUILDING SITES, CITY OF LONDON—At the Mart	Edwin Fox & Bousfield	Oct. 21
•CONTRACTOR'S PLANT AND MACHINERY, ABBEY WOOD, KENT—Depôt, Crossness	Fuller, Horsey, Sons, & Cassell	Oct. 27
•BUILDING SITE, FENCHURCH-STREET—At the Mart	Norton, Trist, & Gilbert	Nov. 3

PATENTS.—*Continued from page 384.*

the iron section, and consisting of a number of cold-water inlet distributing boxes, and a hot-water collecting box; said distributing boxes and collecting box being connected by sheet-metal waterways.

25,130 of 1907.—E. G. WRIGHT: *Devices for Preventing Down-draught in Chimneys and Ventilators.*

This relates to the means for preventing down-draught in chimneys and ventilating shafts, consisting of the combination with a chimney-pot or the like having openings in two of its opposite sides, of cambered plates pivoted or hinged close to the openings, and curved rods fixed to the backs of the plates passing through slots in the sides of the pot or the like, and provided at their ends with knobs.

26,462 of 1907.—J. D. PRIOR: *Domestic Fire-grates.*

This relates to the addition to or combination with the fire-box of an ordinary or domestic fire-grate having a boiler at its back, of a sliding top or cover plate which, when fully drawn forward, closes the said fire-box, and which, when pushed backwards, slides over the top of the boiler, and opens or partially opens the fire-box, and so shaped that when pushed backward for converting the closed fire into an open or partially open fire, it crosses the boiler flue and constitutes a damper for the same; and for an ordinary or domestic fire-grate provided with the said improvements the arrangement at the back of the grate of a hinged flap or door for the closing, partial closing, or opening of the ordinary opening in the said back of the grate communicating directly with the chimney; the parts being so constructed and arranged that the movement of the hinged flap or door is automatically effected by the sliding of the top or cover of the fire-box and the fire-grate.

1,393 of 1908.—G. A. HARVEY: *Revolving Cowl for Smoke or Ventilation and the like.*

This relates to a revolving cowl having vertical wind blades attached at the base to a rim, and at the top to a disc having the centre cut away. Fixed to the upper side of the disc are hollowed propeller-shaped blades, one end in the direction of interior of cowl, the other end curved and fixed in a line with the vertical wind blades. The upper edges of these hollowed and propeller-shaped blades are fixed to a circular plate or cone having wind blades.

2,278 of 1908.—C. W. GRAY and B. L. HURST: *Hanging Gear for Horizontal Sliding Doors, Windows, and the like.*

This relates to a form of hanging gear for horizontal sliding door, windows, and the like, in which the door or window is suspended by a single pin from each of two or more hanging links in such a manner that, if a force be applied to the door or window with the object of opening or closing it, the links take up an inclined position before motion of the door or window ensues, and in which, owing to the inclined position taken up by the hanging links during the operation of opening or closing the door or window, the mass and weight of the door or window assists its movement.

6,257 of 1908.—K. PANTERMULLER: *Chimneys and Ventilation Shafts.*

This relates to the arrangement of fans removably mounted in chimneys or ventilation shafts on doors fitted on the same, and consists in the employment of pivoted doors so that the fans can be moved in and out on said doors by closing or opening the latter, and remain supported by the said pivots while removed from the chimneys or shafts.

8,701 of 1908.—W. D. FORSYTH: *Manufacture of Expanded Metalwork.*

This relates to a process for forming expanded metal, which consists in shearing the sheet metal along longitudinal lines, the slits being formed of four connected portions, one of the portions extending transversely of the line of the slits, one of the portions extending in one direction from the centre of the first slit and parallel to the general line of slits, and the two other portions extending parallel to the first but in opposite directions, and from the ends of the first slit; the second portion of the slit extending up between the third and fourth portions of the next adjacent; striking up the tongues which are formed by the first, third, and fourth slits so that said tongues project at right angles from the body of the plate and have portions at their ends projecting parallel to the plate; and expanding the sheet laterally so that the halves of the tongues will separate at their bases and swing down towards the main sheet; and also consists in an expanded metal consisting of longitudinal ribs or bands connected by transverse ties, each in a place at right angles to the main sheet. These ties are formed in halves connected at the outer ends to the main ribs, and connected together at the inner ends, the ribs and ties being integral.

22,310 of 1907.—E. P. WELLS: *Reinforced Concrete Construction.*

This relates to a reinforcing skeleton for concrete construction, comprising one or more bars or rods of round, square, or elliptical shape in cross-section; each of the said bars or rods being formed with a small thin fin, to which shear members are secured by bolting or riveting.

4,230 of 1908.—J. H. ROBERTSON: *Combined Levelling and Stadia Rod.*

This relates to a stadia rod having a face divided transversely into a plurality of sections of equal length, and of different colours alternating with each other, each section representing the greatest division of the rod, and itself divided into three or more graduated columns: the length of the sub-divisions of each column in passing from a column of smaller to larger subdivisions being a constant multiple of the next succeeding column. Re-entrant angles are arranged at one end of the rod bisecting the smallest subdivisions.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 10.—By J. DAVIES & SON (at Llanelly).

Llanelly, Llangennech, etc., Carmarthen.—The Tack Estate, 1,168 acres, f., y.r. 823*l.* (in lots)	£29,962

September 17.—By GILLOWS (at Broadstairs).

Broadstairs, Kent.—Villa Cap Martin, 1¼ acres, f., p.	2,750
Callis Court-rd., The Beeches, f., p.	900
Callis Court-rd., Cameron, f., p.	875
Lindenthorne-rd., etc., eleven plots of freehold building land	652

September 19.—By MOORE, GARRARD, & SON (at Norwich).

Bedingham, Norfolk.—The Oak Farm, 112½ acres, f. and c., y.r. 95*l.*	1,330

September 22.—By A. G. & A. NOTLEY (at Lowestoft).

Oulton, Suffolk.—Park Hill Estate, 88 acres, f., p.	4,500
Lowestoft, Suffolk.—Arnold-st., freehold flour mill with plant and machinery, p.	2,700
73 Arnold-st., f., p.	850
Oulton Corner, residence and two enclosures, 4½ acres, f.	550
St. John's-rd. (s.), f., y.r. 16*l.*	160
12 and 30, St. John's-rd. (s.); 31, 32, 33, and 34, St. John's-rd., f., y.r. 125*l.*	2,050
Kirkley, Suffolk.—Kirkley Cliff-rd., Merly and building land, f., p.	1,550

September 23.—By WM. PARLOUR (at Northallerton).

Danby Wiske, Yorks.—Redholme Farm, 203 acres, f., y.r. 124*l.*	3,250
Blackbridge Farm, 99 acres, f., y.r. 87*l.*	1,985

By MADDISON, MILES, & MADDISON (at Great Yarmouth).

Ormesby St. Margaret, Norfolk.—"The First and Last" p.h., f., y.r. 42*l.*	1,225
Hemaby-rd., two cottages, 10½ acres, f., y.r. 31*l.*	595

By BIDDELL & BLENCOWE (at Bury St. Edmunds).

Cockfield, Suffolk.—The Oak Farm, 111 a. 3 r. 4 p., f., p.	1,460
Bitcham, Suffolk.—Clay-hill Farm, 73 a. 3 r. 10 p., f., p.	410

September 24.—By WORSFOLD & HAYWARD (at Dover).

Dover, Kent.—10 and 11, De Burgh-st., f., y. and w.r. 36*l.* 12s.	300
215, London-rd., and 2 and 3, Tower-st., f., p.	565

By HENRY HENDRIKS & CO. (at Birmingham).

Edgbaston, Warwick.—11, Calthorpe-rd., u.t. 9 yrs., g.r. 4*l.* 10s., p.	£250
Small Heath, Warwick.—33, 35, and 39, Prince Albert-st., f., w.r. 57*l.* 4s.	600
King's Norton, Warwick.—244 and 246, Franklin-rd., f., w.r. 44*l.* 4s.	575
Handsworth, Warwick.—39, Mostyn-rd., and 26, Gordon-rd., u.t. 89 yrs., g.r. 8*l.* 5s., p.	530

September 25.—By H. W. & C. SPELMAN (at Norwich).

Norwich, Norfolk.—Rampant Horse-st., Fountain's Restaurant (s.), f., p.	660

By HARRY BALL (at Bedford).

Bedford, Beds.—74, Harrington-st., f., p.	255
14, Gadaby-st., f., p.	225
Kempston, Beds.—70, Spring-rd., f., y.r. 13*l.*	205

By DUDLEY W. HARRIS & CO. (at Staines).

Staines, Middx.—Moor-la., five cottages, f., w.r. 78*l.*	860

September 26.—By BOULT, SON, & MAPLES (at Chester.)

Willaston, Cheshire.—Freehold building land, 10¼ acres	1,040
Willaston Smithy, 1 r. 2 p., f., p.	580
Accommodation land, etc., 26½ acres, f.	2,730

By SEXTON & GRIMWADE (at Colchester).

Great Bentley, Essex.—The Plough Farm, 51 a. 1 r. 8 p., f. and c., y.r. 76*l.*	1,425
Great Clacton, Essex.—Elm Farm, 56 a. 1 r. 9 p., c., y.r. 57*l.* 15s.	1,050

By MOORE, GARRARD, & SON (At Framlingham).

Framlingham, Suffolk.—Fore-st., Bridge House and cottage, f., y.r. 9*l.*	550
College-rd., cottage (s.), c., y.r. 21*l.* 15s.	200

September 28.—By BEALE & CAPPS.

Notting Hill.—132, Clarendon-rd. (s.), u.t. 40 yrs., g.r. 15*l.*, y.r. 40*l.*	205

By CRAWTER.

Cobham, Surrey.—Randall's Farm, 20 acres, f., p.	1,200
Potters Bar, Middx.—Southgate-rd., enclosure of land, 4 a. 3 r. 25 p., f., p.	770

By HARLAND & SON.

East Barnet, Herts.—Cat-hill, enclosures of land, 25½ acres, c., y.r. 40*l.*	1,025

By C. M. STANFORD (at Saxmundham).

Orford, Suffolk.—Quay-st., freehold brewery and site, 2 r. 1 p., p.	1,000
Butley, Suffolk.—Main-rd., "The Oyster Inn" p.h., f., 1 a. 2 r. 38 p., p.	1,100
Kelsale, Suffolk.—Meddleton-rd., "The Eight Bells" p.h., f., p.	900
Yoxford, Suffolk.—"The Brewer's Arms" b.h., f., p.	370
Aldeburgh, Suffolk.—High-st., "Bury Cottage" b.h., c., p.	350
33 and 35, High-st., c., p.	375

By WINTERTON & SONS (at Tamworth).

Tamworth, Staffs.—21, Lichfield-st., f., w.r. 31*l.* 4s.	550
Glazcote, Staffs.—Main-rd., freehold building land, 2½ acres	930

By DAVID PRICE (at Builth).

Llanafanfawr, Brecon.—Fronwen Farm, 242 acres, f., y.r. 149*l.*	3,500
Nantyfarddn Farm, 236 acres, f., y.r. 75*l.*	2,000
Brongarth-Uche, Brongarth-Isef, and Tynewydd, 125 acres, f., y.r. 70*l.*	1,500
Tyn-y-cm and Felin Cwmdulos, 30 acres, f.	375

By THOMAS MARTIN, BALL, & CO. (at Exeter).

Topsham, Devon.—Grove Hill, 28 acres, f., p.	5,200

By WHITTON & LAING (at Chudleigh).

Trusham, Devon.—Two cottages, 16¾ acres, f., y.r. 32*l.*	600
Chudleigh, Devon.—Exeter-st., four houses, f., y.r. 28*l.*	400
Clifford-st., five cottages, f., r. 27*l.*	298

September 29.—By C. W. DAVIES & SON.

Islington.—6 and 8, William-st. and stabling, u.t. 37 yrs., g.r. 16*l.*, e.r. 139*l.*	250
Canning Town.—110, Argyle-rd., f., w.r. 18*l.* 4s.	100
Tottenham.—134 and 136, Welbourne-rd., u.t. 66 yrs., g.r. 9*l.*, w.r. 62*l.* 8s.	140

By F. WARMAN.

Enfield.—1 to 10, George's-cottages, u.t. 69 yrs., g.r. 25*l.*, w.r. 104*l.*	250
Holloway.—49, Elthorne-rd. (s.), u.t. 58 yrs., g.r. 6*l.* 10s., y.r. 30*l.*	180

By J. KITTOW & SON (at Launceston).

North-hill, Cornwall.—Main-rd., Westaways Farm, 64 acres, f., y.r. 82*l.*	2,275
West Castic Farm, 256 acres, f., y.r. 70*l.*	2,950
Lewannick, Cornwall.—Penhens and two fields, 16½ acres, f., y.r. 28*l.*	745
Knighton Estate, 124 acres, f., y.r. 258*l.*, together with one equal undivided one-seventh share in the Manor of Trevague	5,900
Adams Trewint and Farm, 46 acres, f., y.r. 115*l.*	2,400

By DANIEL, SMITH, SON, & OAKLEY (at Lewes).

Newhaven, Sussex.—Part of the Newhaven Estate, six plots of building land, f.	1,150

By ROBERT WOOD (at Hereford).

Ryelands, Hereford.—Aston Villa, f., y.r. 12*l.*	253

By BIDWELL & SONS (at King's Lynn).

Swaffham, Norfolk.—Fuller's Farm and Copper Hall Farm, 235 acres, f., p.	6,970

September 30.—By FRED. VARLEY & SON

Finsbury Park.—5, Adolphus-rd., u.t. 65 yrs., g.r. 9*l.* 13*s.*, y.r. 55*l.*	£385
Stoke Newington.—90, Lordship-rd., u.t. 38 yrs., g.r. 10*l.* 10*s.*, e.r. 55*l.*	200
Finsbury Park.—49, Pooles-pk. (s.), u.t. 57 yrs., g.r. 7*l.*, e.r. 36*l.*	170
9, Woodberry-gr., u.t. 55 yrs., g.r. 12*l.* 12*s.*, p.	405

By DOUGLAS YOUNG & CO.

Westminster.—Vincent-sq., 26, 27, 28, and 29, New-st., f., y.r. 183*l.* 12*s.*	2,804
Clapham.—8 and 10, Burland-rd., u.t. 75 yrs., g.r. 12*l.*, w.r. 83*l.* 4*s.*	475

October 1.—By ARTHUR BARTON.

Lee.—9 and 11, Taunton-rd., u.t. 51 yrs., g.r. 10*l.*, w.r. 72*l.* 16*s.*	325

By MARK LIELL & SON.

Leyton, Essex.—34 to 52, Westerham-rd., f., w.r. 469*l.* 6*s.*	3,860
52 to 58 (even), Bromley-rd., f., w.r. 114*l.* 8*s.*	835
12, 14, 16, 18, 29, and 31, Warren-rd., u.t. 80 yrs., g.r. 9*l.*, w.r. 182*l.* 16*s.*	1,350
20, Grove Green-rd., u.t. 80 yrs., g.r. 1*l.* 10*s.*, w.r. 32*l.* 10*s.*	225

By NEWBON, SHEPHARD, & EDWARDS

Barnsbury.—35, Offord-rd., u.t. 30 yrs., g.r. 7*l.*, y.r. 44*l.*	275
17 and 18, Thornhill-sq., u.t. 37 yrs., g.r. 14*l.*, y.r. 96*l.*	660
Bethnal Green.—27 and 28, Robinson-rd., u.t. 46 yrs., g.r. 8*l.*, w.r. 78*l.*	470
29 and 30, Robinson-rd., u.t. 46 yrs., g.r. 8*l.*, w.r. 83*l.* 4*s.*	500

By STIMSON & SONS.

Blackfriars.—43 to 58, Little Surrey-st. (two s.), f., y. and w.r. 531*l.* 16*s.*	3,200
Old Kent-rd.—13, 15, 17, and 19, Shorncliffe-rd., u.t. 36½ yrs., g.r. 12*l.* 17*s.* 6*d.*, w.r. 145*l.* 12*s.*	535
Poplar.—16 and 18, Vesey-st., f., w.r. 58*l.* 10*s.*	435
Newington Butts.—29, Alberta-st., u.t. 33 yrs., g.r. 6*l.*, e.r. 38*l.*	235
City-rd.—11, 12, 35, 37, 40, and 48, Hall-st., u.t. 33½ yrs., g.r. 34*l.* 10*s.*, y. and e.r. 292*l.*	1,545
42 and 44, New Charles-st., u.t. 33½ yrs., g.r. 10*l.*, y.r. 74*l.*	430
8, Remington-st., u.t. 16¼ yrs., g.r. nil, y.r. 34*l.*	120
Hoxton.—30, Herbert-st., u.t. 33½ yrs., g.r. 6*l.* 6*s.*, y.r. 47*l.*	250
Islington.—37, Alfred-st., u.t. 17½ yrs., g.r. 5*l.*, y.r. 36*l.*	140
8, Sudely-st., u.t. 17½ yrs., g.r. 5*l.*, y.r. 38*l.*	140
9, Vincent-ter., u.t. 17½ yrs., g.r. 6*l.*, q.r. 46*l.*	145
Highbury.—25 and 27, Kelvin-rd., u.t. 51 yrs., g.r. 14*l.*, y. and e.r. 92*l.*	460
Stoke Newington.—27 and 29, Clissold-rd., u.t. 40 yrs., g.r. 16*l.*, y.r. 94*l.*	600

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

PUBLISHER'S NOTICES.

Nat. Tel., 6111 Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME XCIV. (January to June, 1908) was given as a supplement with July 18 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

THE NINETY-FOURTH VOLUME of "The Builder" (bound), price Twelve Shillings and sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 1s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, etc., etc.

Six lines or under ..... 6s. 0d.
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Four lines (about thirty words) or under ..... 2s. 0d.
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PREPAYMENT IS ABSOLUTELY NECESSARY.

. Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," 4, Catherine Street, W.C.

Advertisements for the current week's issue are received up to ONE p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after TWELVE NOON on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have *Replies addressed to the* OFFICE, 4, CATHERINE ST., STRAND, W.C., *free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

PRICES CURRENT OF MATERIALS.

. Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.		
Best Stocks	1	6	0	per 1000	alongside, in river.
Picked Stocks for Facings	2	10	0	"	delivered
Flettons	1	6	0	"	at railway depôt.
Best Fareham Red	3	12	0	"	" "
Best Red Pressed Ruabon Facing	5	0	0	"	" "
Best Blue Pressed Staffordshire	3	15	0	"	" "
Do. Bullnose	4	0	0	"	" "
Best Stourbridge Fire Bricks	3	14	0	"	" "
GLAZED BRICKS.					
Best White and Ivory Glazed Stretchers	10	7	6	"	" "
Headers	9	17	6	"	" "
Quoins, Bullnose, and Flats	13	17	6	"	" "
Double Stretchers	15	17	6	"	" "
Double Headers	12	17	6	"	" "
One Side and two Ends	16	17	6	"	" "
Two Sides and one End	17	17	6	"	" "
Splays, Chamferred, Squints	15	10	0	"	" "
Best Dipped Salt Glazed Stretchers	10	7	6	"	" "
Headers	9	17	6	"	" "
Quoins, Bullnose, and Flats	13	17	6	"	" "
Double Stretchers	15	17	6	"	" "
Double Headers	12	17	6	"	" "
One Side and two Ends	16	17	6	"	" "
Two Sides and one End	17	17	6	"	" "
Splays, Chamferred, Squints	15	10	0	"	" "
Second Quality White and Dipped Salt Glazed	1	5	0	per 1000	less than best.

	£	s.	d.	
Thames and Pit Sand			6	6 per yard, delivered.
Thames Ballast		5	0	" "
Best Portland Cement		28	0	per ton, "
Best Ground Blue Lias Lime		19	0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	£	s.	d.	
BATH STONE—delivered on road waggons, Paddington Depôt		1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt		1	8½	" "
PORTLAND STONE (20 ft. average)—				
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1		" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	½		" "
Ancaster in blocks	1	10		perft.cube, deld.rly.depôt.
Beer "	1	6		" "
Greenshill "	1	10		" "
Darley Dale in blocks	2	4		" "
Red Corsehill "	2	2		" "
Closeburn Red Freestone	2	0		" "
Red Mansfield "	2	4		" "
YORK STONE—*Robin Hood Quality.*				
Scappled random blocks	2	10		" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3		per ft. super. "
6 in. rubbed two sides ditto, ditto	2	6		" "
3 in. sawn two sides slabs (random sizes)	0	11½		per ft. cube "
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½		" "
1½ in. to 2 in. ditto, ditto	0	6		" "
HARD YORK—				
Scappled random blocks	3	0		" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	8		per ft. super. "
6 in. rubbed two sides ditto	3	0		" "
3 in. sawn two sides slabs (random sizes)	1	2		" "
2 in. self-faced random flags	0	5		" "

SLATES.

In.	In.	£	s.	d.	
20	10 best blue Bangor	13	2	6	per 1000 of 1200 at r.d.
20	12 " "	13	17	6	" "
20	10 first quality	13	0	0	" "
20	12 " "	15	15	0	" "
16	8 " "	7	5	0	" "
20	10 best blue Portmadoc	12	12	6	" "
16	8 " "	6	12	6	" "
20	10 best Eureka unfading green	15	17	6	" "
20	12 " "	18	7	6	" "
18	10 " "	13	5	0	" "
16	8 " "	10	5	0	" "
20	10 permanent green	11	12	6	" "
18	10 " "	9	12	6	" "
16	8 " "	6	12	6	" "

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000, at rly depôt.
Hip and Valley tiles	3	7	per doz. "
Best Broseley tiles	50	0	per 1000 "
Do. Ornamental tiles	52	6	" "
Hip and Valley tiles	4	0	per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 "
Do. Ornamental do.	60	0	" "
Hip tiles	4		per doz. "
Valley tiles	3	0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 "
Do. Ornamental do.	54	6	" "
Hip tiles	4	1	per doz. "
Valley tiles	3	8	" "
Best "Rosemary" brand plain tiles	48	0	per 1000 "
Best Ornamental tiles	50	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	8	" "
Best "Hartshill" brand plain tiles, sand-faced	50	0	per 1000 "
Do. pressed	47	6	" "
Do. Ornamental do.	50	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	6	" "
Staffordshire (Hanley) Reds or Brindled tiles	42	6	per 1000 "
Hand-made sand-faced	45	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	6	" "

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13	10	0	... 15	0	0
Deals: best 3 by 9	13	0	0	... 14	0	0
Battens: best 2½ in. by 7 in. and in., and 3 in. by 7 in. and 8 in.	11	0	0	... 12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best.		
Battens: seconds	0	10	0	"	"	
2 in. by 4 in. and 3 in. by 6 in.	9	0	0	... 10	0	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	... 9	10	0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	"		
Fir timber: best middling Dantzig or Memel (average specification)	At per load of 50 ft. 4	10	0	... 5	0	0
Seconds	4	0	0	... 4	10	0
Small timber (8 in. to 10 in.)	3	12	6	... 3	15	0
Small timber (6 in. to 8 in.)	3	0	0	... 3	10	0
Swedish balks	2	10	0	... 3	0	0
Pitch-pine timber (30 ft. average)	4	0	0	... 4	15	0

JOINERS' WOOD.	At per standard.					
White Sea: first yellow deals, 3 in. by 11 in.	24	0	0	... 25	0	0
3 in. by 9 in.	22	0	0	... 23	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	... 18	0	0
Second yellow deals, 3 in. by 1 in.	18	10	0	... 20	0	0
" " 3 in. by 9 in.	17	10	0	... 19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	... 14	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	... 14	0	0
Do. 3 in. by 9 in.	12	10	0	... 14	0	0
Battens	10	0	0	... 11	0	0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	14	10	0	... 15	10	0
" " 3 in. by 9 in.	13	10	0	... 14	10	0
Battens	11	0	0	... 12	0	0
Second white deals, 3in. by 11 in.	13	10	0	... 14	10	0
" " 3 in. by 9 in.	12	10	0	... 13	10	0
Battens	10	0	0	... 11	0	0
Pitch-pine: deals	18	0	0	... 21	0	0
Under 2 in. thick extra	0	10	0	... 1	0	0
Yellow pine—First, regular sizes	44	0	0	upwards.		
Oddments	32	0	0	"		
Seconds, regular sizes	33	0	0	"		
Oddments	28	0	0	"		
Kauri Pine—Planks, per ft. cube	0	3	6	... 0	5	0
Dantzig and Stettin Oak Logs— Large, per ft. cube	0	3	0	... 0	3	9
Small "	0	2	6	... 0	2	6
Wainscot Oak Logs, per ft. cube	0	5	6	... 0	6	0
Dry Wainscot Oak, per ft. sup. as inch	0	0	8½	... 0	0	9½
¾ in. do. do	0	0	7	...	—	
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	... 0	1	0
Selected, Figury, per ft. super. as inch	0	1	6	... 0	2	6
Dry Walnut, American, per ft. super. as inch	0	0	10	... 0	1	0
Teak, per load	17	0	0	... 22	0	0
American Whitewood Planks, per ft. cube	0	4	0	... 0	5	0
Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	... 0	17	0
1 in. by 7 in. yellow, planed and matched	0	14	0	... 0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	... 1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	... 0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	... 0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	... 0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	... 0	13	6
1 in. by 7 in. " "	0	14	0	... 0	18	0
¾ in. by 7 in. white " "	0	10	0	... 0	11	6
1 in. by 7 in. " "	0	12	9	... 0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.			Per ton, in London. £ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	...	7 10 0	
Compound Girders, ordinary sections	9 0 0	...	10 0 0	
Steel Compound Stanchions	11 0 0	...	12 0 0	
Angles, Tees, and Channels, ordinary sections	9 0 0	...	10 0 0	
Flitch Plates	9 0 0	...	9 10 0	
Cast Iron Columns and Stanchions including ordinary patterns	7 10 0	...	8 10 0	

METALS.

	Per ton, in London. £ s. d.			
IRON—				
Common Bars	8 10 0	...	9 0 0	
Staffordshire Crown Bars, good merchant quality	8 15 0	...	9 5 0	
Staffordshire "Marked Bars"	10 10 0	...	—	
Mild Steel Bars	8 15 0	...	9 5 0	
Hoop Iron, basis price	9 5 0	...	9 10 0	
" " Galvanised	17 0 0	...	—	
("And upwards, according to size and gauge.)				
Sheet Iron Black—				
Ordinary sizes to 20 g.	9 15 0	...	—	
" " 24 g.	10 15 0	...	—	
" " 26 g.	12 5 0	...	—	
Sheet Iron, Galvanised, flat, ordinary quality—				
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15 0 0	...	—	
Ordinary sizes to 22 g. and 24 g.	15 10 0	...	—	
" " 26 g.	16 10 0	...	—	
Sheet Iron, Galvanised, flat, best quality—				
Ordinary sizes to 20 g.	18 0 0	...	—	
" " 22 g. and 24 g.	18 10 0	...	—	
" " 26 g.	20 0 0	...	—	
Galvanised Corrugated Sheets—				
Ordinary sizes, 6 ft. to 8 ft. 20 g.	14 10 0	...	—	
" " 22 g. and 24 g.	14 15 0	...	—	
" " 26 g.	16 5 0	...	—	
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	...	—	
Best Soft Steel Sheets, 22 g. & 24 g.	13 0 0	...	—	
" " " 26 g.	15 0 0	...	—	
Cut Nails, 3 in. to 6 in.	10 10 0	...	11 0 0	
(Under 3 in., usual trade extras.)				

	Per ton, in London. £ s. d.			
LEAD, &c.— Sheet, English, 3lb. and up.	16 10 0	...	—	
Pipe in coils	17 0 0	...	—	
Soil pipe	19 10 0	...	—	
Compo pipe	20 10 0	...	—	
ZINC—Sheet—				
Vieille Montagne ...ton	26 15 0	...	—	
Silesian	26 10 0	...	—	
COPPER—				
Strong Sheet...per lb.	0 1 0	...	—	
Thin " "	0 1 1	...	—	
Copper nails "	0 0 10	...	—	
Copper wire "	0 0 10	...	—	
BRASS—				
Strong Sheet "	0 0 11	...	—	
Thin "	0 1 0	...	—	
TIN—English Ingots "	0 1 4	...	—	
SOLDER—Plumbers' "	0 0 7	...	—	
Tinmen's "	0 0 9½	...	—	
Blowpipe "	0 0 11½	...	—	

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d. per ft. delivered.
" fourths	1¼d. " "
21 oz. thirds	3d. " "
" fourths	2½d. " "
26 oz. thirds	4d. " "
" fourths	3d. " "
32 oz. thirds	4½d. " "
" fourths	4¼d. " "
Fluted Sheet, 15 oz.	3½d. " "
" 21 oz.	4½d. " "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

¼ Hartley's	2½d. per ft. delivered.
⅜ "	2½d. " "
½ "	2½d. " "
Figured, Oxford Rolled, and "Oceanic" Glass, white	3½d. " "
" " tinted	5d. " "
OTHER GLASS—	
"Artic" Glass, white	4d. " "
" " tinted	5½d. " "
" " Ruby and opalescents	1s. " "

		£ s. d.
OILS, &c.		
Raw Linseed Oil in pipes	per gallon	0 1 11
" " " in barrels	"	0 2 0
" " " in drums	"	0 2 2
Boiled " " in pipes	"	0 2 1
" " " in barrels	"	0 2 2
" " " in drums	"	0 2 4
Turpentine in barrels	"	0 2 3
" in drums	"	0 2 6
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	"	20 0 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

	Per gallon. £ s. d.
VARNISHES, &c.	
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 6
Fine Elastic Carriage	0 12 0
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flating Varnish	0 18 0
White Pale Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 0
Berlin Black	0 16 0
Knotting	0 10 9
French and Brush Polish	0 10 6

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursday.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcement of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

*** Denotes *accepted.* † Denotes *provisionally accepted.***

BARKING TOWN.—For Upney Valley drainage (second portion), for the Urban District Council. Mr. C. F. Dawson, Surveyor, Public Offices, Barking:—

D. T. Jackson, Barking* £936 6 7

BRISTOL.—For the erection of a new place of worship at Stapleton Workhouse, for the Guardians:—

C. Hodges	£1,645 0 0	E. Love	£1,347 0 0
S. Williams & Sons	1,575 0 0	H. Wilkins	1,341 0 0
Stephens, Bastow, & Co.	1,448 0 0	D. J. Tanner & Son	1,297 0 0
A. J. Colbourne	1,430 0 0	J. W. Marsh	1,260 0 0
F. S. Hunt	1,389 0 0	Marsh & Stone	1,230 0 0
G. Downs & Son	1,380 0 0	J. Browning	1,225 18 0
F. Chown	1,367 0 0	C. Harvey	1,135 0 0
E. Clark & Sons	1,359 15 0	S. Lovell, 54, Cotham-road	1,120 0 0

BROMLEY.—For the erection of secondary school for girls, for Kent Education Committee. Mr. W. H. Robinson, Architect to Committee:—

Chadwell Heath Joinery Co.	£10,550 10 0
Higgs & Hill, Ltd.	9,994 0 0
Parry Bros.	9,977 0 0
F. P. Dutholt	9,875 0 0
T. D. Gratty	9,685 0 0
Lole & Co.	9,569 0 0
S. Santo, Ltd.	9,550 0 0
T. & H. F. Higgs	9,536 0 0
J. C. Arpaud & Son	9,475 0 0
J. A. Davison	9,472 0 0
B. E. Nightingale	9,444 0 0
Holloway Bros.	9,400 0 0
H. Kent	9,393 0 0
Cropley Bros.	9,383 0 0
W. Nash	9,378 0 0
Thomas & Edge	9,372 0 0
A. E. Tong	9,364 0 0
J. & M. Patrick	9,299 0 0
F. & G. Foster	9,243 0 0
J. Appleby & Sons	9,240 0 0
Johnson & Co.	9,200 0 0
Treasure Bros.	9,150 0 0
J. Chessum & Sons	9,138 0 0
Drowley & Co.	9,061 0 0
W. J. Renshaw	8,989 0 0
Courtney & Fairbairn	8,979 0 0
J. & C. Bowyer, Ltd.	8,976 0 0
T. Crossley & Son	8,963 0 0
W. H. Hyde & Co.	8,934 0 0
G. E. Wallis & Sons	8,896 0 0
G. Browning	8,870 0 0
J. W. Jerram	8,859 0 0
J. Lonsdale	8,814 0 0
R. A. Lowe & Co.	8,736 0 0
C. E. Skinner	8,727 0 0
W. E. Blake	8 670 0 0
W. F. Blay, Ltd.	8,650 0 0
J. Podger & Sons	8,529 0 0
A. S. Ingleton, Herne Bay*	8,327 0 0

BURTON-UPON-TRENT.—For the works to be done and materials to be supplied in the reconstruction of No. 6 second-class slipper baths, etc., at the Public Baths, for the Corporation. Mr. George T. Lynam, Borough Engineer and Surveyor, Town Hall, Burton-upon-Trent:—

J. & G. W. Selby, Edward-street, Burton £198

CAERPHILLY.—For paving, sewering, etc., part of Eglwysilan-road, Abertridwr, Morgan-street, and Church-street, Llanbradach, for the Urban District Council. Mr. A. O. Harpur, Surveyor to Council, Cardiff-road, Caerphilly:—

W. Burton	£947 12 5	A. G. Collins & Co.	£808 19 0
G. L. Morgan	839 7 6	G. Rutter, Barry*	767 7 9
R. Webb & Son	823 16 1		
W. J. Morgan	816 12 7		

CAMBRIDGE.—For constructing certain sewers at the Union Workhouse, for Chesterton Guardians. Mr. W. Wren, Surveyor, Cambridge:—

Redding & Son	£305 0	H. J. Flack	£210 0
E. Willmott & Son	290 10	H. Rooke, Cambridge	198 0
S. B. Mortlock	250 10		
A. Negus & Sons	240 0		

CHELMSFORD.—For the erection of new offices in Duke-street, Chelmsford, for the Essex Education Committee. Mr. F. Whitmore, architect:—

Kirk & Randall	£4,988 0	W. E. Blake	£4,250 0
Lorden & Sons	4,875 0	F. & E. Willmott	4,230 0
Allen & Gowers	4,825 0	A. E. Farr	4,218 0
C. Roper	4,640 0	F. H. Davey	4,177 0
Johnson & Co.	4,640 0	Mason & Sons	4,150 0
Grimwood & Sons	4,497 0	Potter & Son	4,147 0
Dowsing & Davis	4,475 0	Wallis & Son	4,143 0
H. Smith	4,447 0	S. A. Kenney	4,133 0
Lawrence & Sons	4,444 0	Spencer, Santo, & Co.	4,100 0
Knight & Son	4,357 0	Smith & Son	4,075 0
Grimwood & Sons	4,333 0	Johnson & Hawkes	3,997 7
Pattinson & Son	4,324 0	Parkington & Son, Ipswich*	3,900 0
Jesse Gowers	4,300 0		
F. Bennett	4,300 0		
Everitt & Sons	4,300 0		

[Architect's estimate, £4,000.]

CHESTERFIELD.—For alterations to Stephenson Memorial Hall. Mr. Vincent Smith, Borough Surveyor, Salter-gate, Chesterfield:—

J. Collis & Sons	£506 18 0
G. F. Kirk	460 0 0
J. Wright, Chesterfield*	451 10 6

CROYDON.—For erecting a secondary school for girls (the Crescent), to accommodate 380 pupils, for the Education Committee. Mr. H. Carter Pegg, F.R.I.B.A., Thornton Heath. Quantities by Mr. Mansfield Price, Salatin, Sutton, Surrey:—

F. T. Bruton & Son	£17,099
H. C. Clifton	16,130
W. J. Norris	15,580
H. & G. Taylor	15,383
W. King & Son	15,106
F. Gough & Co.	15,100
Foster & Dickson	14,988
G. Everitt	14,800
J. Smith & Sons, Ltd.	14,780
F. & G. Foster	14,761
W. F. Blay	14,725
E. P. Bulled & Co.	14,598
W. Akers & Co., Ltd.	14,437
Sabey & Son, Ltd.	14,342
G. Jaggard	14,285
McCarthy E. Fitt	14,283
J. Allen & Sons, Ltd.	14,000
J. & C. Bowyer, Ltd.	13,990
H. Lovatt	13,958
E. J. Saunders	13,950
W. Smith & Sons	13,921
W. Moss & Sons, Ltd.	13,920
G. E. Wallis & Sons, Ltd.	13,779
Holliday & Greenwood	13,777
W. H. Hyde & Co.	13,750
Spencer, Santo, & Co., Ltd.	13,650
B. E. Nightingale, Albert-embankment, S.E.*	13,405
W. Wallis	13,338

EALING.—For building Lammas Council school, for Education Committee:—

Spencer, Santo, & Co., 259, Warwick-road, Kensington† £15,969

GOREBRIDGE (Scotland).—Accepted for new infant's school and alterations on present school, including new workshop and cookery room, for Stobhill School Board. Mr. A. Murray Hardie, 20, George-street, Edinburgh. Quantities by Mr. George Morham, Hanover-street, Edinburgh:—

Mason: Bennet, Gorebridge, Midlothian	£1,412
Joiner: Kinaley Bros., Gorebridge, Midlothian	1,349
Smith: W. H. Kirkwood, Dalkeith, Midlothian	72
Plumber: Blackie, 5, Coniston-road, Edinburgh	387
Slater: Clapperton, Gorebridge, Midlothian	252
Plasterer: J. Deas, Bonnyrigg, Midlothian	185
Glazier: Cunningham, Edinburgh	43
Painter: Cochrane, Gorebridge, Midlothian	79
Heating: Meikle & Philp, Edinburgh	162

HENDON.—Erection of factory, Collingdale-avenue, for Messrs. Dickinson. Messrs. Meaken, Archer, & Stoneham, surveyors:—

A. J. Staines & Co., 154, Great Lichfield-street, Oxford-street* £1,300

LEYTON.—For making-up, paving, kerbing, etc., certain private streets in the district, for the Urban District Council. Mr. William Dawson, M.Inst.C.E., Surveyor to the Council, Town Hall, Leyton:—

T. Free & Sons	£2,180 12 9
W. Griffiths & Co.	2,180 3 10
T. Adams	2,176 17 9
F. J. Coxhead	2,068 0 0
Seymour & Hanson	2,002 13 11
G. J. Anderson	1,982 3 2
W. Manders	1,959 10 0
McLean & Co.	1,931 2 7
O. T. Gibbons, Leytonstone*	1,899 7 6

[Surveyor's estimate, £2,080 2.]

LLANDOVERY.—For the erection of a new school. Mr. W. Vincent Morgan, A.R.I.B.A., County Education Architect:—

W. D. Morgan	£5,460 0 0
Brown, Thomas, & John	5,436 0 0
D. B. John	5,428 10 0
B. Howell & Son, Ltd.	5,300 0 0
E. Evans	5,185 0 0
M. Morgan & Sons	5,150 0 0
W. J. & S. L. Michael	4,850 0 0
G. Mercer	4,750 0 0
Jones Bros.	4,717 0 0
E. G. Groom	4,654 0 0
D. Davies	4,600 0 0
R. Davies	4,519 0 0
Thomas Bros., Llandilo*	4,450 0 0

LONDON.—For supply and erection of polling-station fittings, for the Camberwell Borough Council:—

Messrs. Flere & Mills, Anchor Works, St. Anne's-road, Limehouse—£1 15s. for each station, and 5s. extra for each additional secret-voting compartment supplied. Five years' contract.

LONDON.—For repairs and decorations to the Magdala public-house, Lordship-lane, S.E., for Truman, Hanbury, Buxton, & Co., Ltd. Mr. A. E. Sewell, surveyor:—

Bridgeman	£333	Snowin Bros	£269
Harper	314	Pringle*	265

LONDON.—For warehouse, 47, Queen Elizabeth-street, Tower Bridge, S.E. Mr. Arthur W. Osborn, architect, 90 and 91, Queen-street, Cheapside, E.C. Quantities by Mr. W. James Pumphilon, surveyor, 21, Finsbury-pavement, E.C.:—

Potton & Sons	£2,990 0	Hoare & Son	£2,839 0
Hawtrey & Son	2,913 10	Sheffield Bros.‡	2,760 0
Renwick	2,912 0	Watt	2,670 0
Symes	2,910 0	Parsons	2,654 0

‡ Accepted after modification.

NEWPORT (Mon.).—For new Y.M.C.A. buildings and adapting existing premises, for the Building Committee, Mr. C. E. Compton and Messrs. Habershon, Fawckner, & Co., architects, High-street, Newport. Quantities by Mr. C. Miles, Central-chambers, Newport.

	As Bill of Quantities.	Add extra if Forest Stone substituted for Bath.	Add extra if Ham Hill substituted for Bath.	Extra if Terra-Cotta substituted for Bath.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
D. Davies & Sons	5,800 0 0	85 0 0	70 0 0	No extra
W. Jewell & Sons	5,725 0 0	146 0 0	73 0 0	No extra
J. Jenkins, Ltd.	5,650 0 0	100 0 0	72 0 0	40 0 0
F. R. Cooper & Co.	5,650 0 0	90 10 0	72 0 0	45 0 0
R. W. Moon	5,575 0 0	132 0 0	90 0 0	40 0 0
Tydeman Bros.	5,475 5 2	84 9 2	99 9 3	24 7 1
E. F. King & Co.	5,448 0 0	75 10 6	10 0 less	17 0 6 less
A. S. Morgan & Co.	5,400 0 0	100 0 0	100 0 0	150 0 0
G. F. Leadbeter	5,400 0 0	120 0 0	100 0 0	50 0 0
J. N. Morgan	5,300 0 0	124 0 0	120 0 0	90 0 0
T. Jerrett	5,199 0 0	65 0 0	28 0 0	31 0 0
F. W. Powles	5,198 0 0	110 0 0	90 0 0	44 0 0
Jordan & Son	5,195 0 0	63 12 0	27 16 0	268 14 8
J. Charles	5,195 0 0	119 0 0	95 0 0	49 0 0
D. W. Richards & Son	5,189 0 0	87 0 0	66 0 0	32 0 0
H. Williams & Co.	5,075 0 0	165 10 0	145 4 6	4 12 0
C. H. Reed, Newport*	4,950 0 0	125 5 4	111 7 0	52 8 1
Surveyor's estimate	5,150 0 0	120 0 0	110 0 0	50 0 0

NOTTINGHAM.—For erection of a pair of semi-detached villas, Warwick-road, Nottingham. Mr. A. R. Calvert and Mr. William R. Gleave, A.R.I.B.A., architects:—

W. Maule & Co.* £1,483

[Lowest of eight tenders.]

MILTON REGIS.—For the enlargement of Upton-lane Council school, for Kent Education Committee. Mr. W. H. Robinson, Architect to the Committee:—

Treasure Bros.	£3,179 0 0	Pavey & Sons	£2,655 0 0
Johnson & Co.	2,915 0 0	Amos & Ford	2,580 0 0
Jones & Andrews	2,893 0 0	L. Seager	2,563 0 0
Spencer, Santo, & Co., Ltd.	2,886 10 0	Bowes Bros.	2,545 10 0
Abbot & Charlton	2,867 5 0	Sturry Building Co.	2,539 10 0
J. Wilford	2,780 0 0	H. J. Tidy	2,539 0 0
C. E. Skinner	2,743 0 0	T. Monk	2,487 0 0
West Bros.	2,712 0 0	E. Bishop & Sons, Albany-road, Sittingbourne*	2,463 0 0
C. B. Benfield	2,690 0 0		

QUEENBOROUGH.—For providing and laying 637 lin. yds. of 12-in. stoneware pipe sewer, and 50 lin. yds. of 30-in. steel ribbed concrete tubes, and sinking well, for the Town Council. Mr. Horatio Small, Borough Surveyor, Queenborough:—

Sewer, &c.

Ellis & Dutton	£685 3 7	Hancock Bros., Queenborough*	£310 0 0
Mellen & Chrisfield	498 3 6		

[Surveyor's estimate, £313 13 6.]

Sinking a Well round borehole at waterworks, 6 ft. internal diameter.

	Per foot to 200 ft.	Per foot to 250 ft.
T. Lilley & Son	£2 15 0	£3 0 0
Johnson & Anderson	2 7 6	3 0 0
R. Batchelor	1 19 9	2 7 6
A. Williams	1 17 6	1 17 6
Hancock, Bros., Queenborough*	1 6 0	1 11 0

SHOTTON (Hawarden).—For new Council school, for Flintshire Education Committee. Mr. S. Evans, County Surveyor, County Buildings, Mold:—

E. O. Probert	£6,672 4 8
Parker Bros.	6,543 0 0
W. Hopkins	6,300 0 0
R. Costain & Sons	6,239 0 0
Hughes & Stirling	5,991 0 0
J. Mayers & Sons	5,956 16 0
C. Griffiths	5,896 0 0
H. Kelly & Bros.	5,869 0 0
E. Blane & Sons	5,787 0 0
T. Spencer	5,770 0 0
R. Williams	5,753 15 4
R. Carlyle	5,595 0 0
T. E. Russell	5,518 0 0
J. M. Greenhalgh & Co.	5,473 0 0
G. Wright & Sons, Harwarden*	5,395 0 0

SIDMOUTH.—For new mixed Council school for 260 children at Woolbrook, including boundary walls, tarpaving, offices, and covered sheds, for Devonshire County Education Committee. Mr. Percy Morris, County Architect (Education), 1, Richmond-road, Exeter. Quantities by Mr. S. W. Haughton, 22, Courtenay-street, Plymouth:—

R. G. Spiller	£3,368 0 0
R. W. & J. Skinner	3,345 5 3
Bird & Pippard	3,294 13 0
C. Turner	3,222 7 5
W. E. Bennet	3,219 7 6
G. B. Turpin	3,174 0 0
F. J. Badcock	3,156 15 2
J. J. Lacey & Co.	3,133 5 8
Johnson & Co.	3,105 3 3
W. G. Coles	2,989 10 7
N. Pratt	2,986 14 8
F. J. Stanbury	2,984 16 8
Wilkins & Son	2,889 0 0
Westcott, Austin, & White	2,856 0 0
Wakeham Bros., Plymouth*	2,824 0 0

[Architect's estimate, £2,928 7.]

TREHARRIS.—For erecting a free library at Perrott-street, for Merthyr Tydfil Borough Council. Mr. W. Dowdeswell, architect, Treharris. Quantities by architect:—

Jones Bros., Quaker's Yard* £2,340

TWICKENHAM.—In the tender which appeared under this heading in our issue for September 26, the successful contractor, Mr. William E. Rhodes, is stated to be of Chiswick. This is incorrect; it should have been Ealing. The mistake was not ours, the information being printed as received.

WREXHAM.—For the relaying of sewer in the Barnfield, for the Corporation. Mr. John England, Borough Engineer:—

J. Stephens, 38, Penybryn, Wrexham* £71 5 10

Ham Hill Stone.
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The Ham Hill and Doulting Stone Co., Limited
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Norton, Stoke-under-Ham, Somerset.
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

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REVIEWS OF BOOKS:

Monthly Supplement to "The Builder."

Books.

A Summary of the Architectural Monuments of Cyprus (chiefly mediæval and later). A contribution to the general archæological survey of the island. Prefatory notes and Part VI.—Kyrenia District. Compiled by G. JEFFERY, Curator of Ancient Monuments in Cyprus. (Cyprus: Printed at the Government Printing-office, Nicosia. 1907. Price 4d. Paper, 9¾ in. by 6 in.)

MR. G. JEFFERY is known to those interested in Cypriote remains as one who for some years has busied himself with the further investigation of the mediæval work, and he has apparently now found his true sphere as Curator of Ancient Monuments in the island.

In this tract, which shows us his plan of campaign in getting together the Byzantine remains of the island, the author expressly states that he is taking up a part of Cypriote work which was excluded from M. Enlart's book,* but he refers appreciatively to the brilliant work of the Frenchman, which will always remain the introduction to the fine Latin remains.

Mr. Jeffery is quite right to get his villages together like this with some account, however brief, of their foundation, and the number and importance of their churches, etc. In his prefatory note he remarks on the extreme difficulty of dating any old village church in Cyprus. This is just as true of the other considerable islands in the Mediterranean.

Of equal general truth is this note:—

"The village churches of Cyprus as we see them at the present day are either the faded ghosts of once gorgeously decorated little sanctuaries, or the bare whitewashed barn-like structures on a larger scale of the last three centuries."

The "Pseudo-classic or Renaissance" element is not so apparent in Cyprus as elsewhere, or, as we should prefer to say, the classic element is not so apparent in the *pseudo-Byzantine* village churches—that term representing as accurately as any other, perhaps, the character of village churches in the Mediterranean generally.

The question comes to be, Would this work of Mr. Jeffery's not be worthy of a better setting?

Photographic illustrations may be forthcoming in a later part of the "summary," but let us suggest not only that they be included, but that they be really good ones, as good photographic plates as can be got if the subjects are at all worth it. We fancy from what the author here says that some of them are worth it. M. Gerola's sumptuous book on mediæval and later architecture in Crete, recently published, illustrates what a good show may be made of this pseudo-Byzantine work.

Perhaps in a future edition Mr. Jeffery might state (*a*) the exact period of Venetian domination in Cyprus, and (*b*) the exact period (if it can be differentiated from his own subject-matter) of the work represented in M. Enlart's book.

Roman Hayling: A Contribution to the History of Roman Britain. By TALFOURD ELY, D.Lit., etc. Second and enlarged edition, with two plans and illustrations. (London: Taylor & Francis. 1908. 3s. net. Boards, 9¾ in. by 6 in.)

THE author states that this short account of excavations at Hayling Island originated as a thesis for the degree of Doctor of Literature in London University.

It is a creditable attempt to investigate a portion of Roman Britain, a little wordy and disconnected, but decidedly of value as a contribution to the study of local Roman remains. The style may be judged from the following quotation taken at random from p. 6:—"When the plan of this excavation was submitted to a friend, who is one of the most distinguished of those versed in Romano-British antiquities, he suggested that the mass of foundation represented a paved yard or street rather than a wall. Unfortunately I omitted to explain to him," etc.

The most readable part of the treatise is the discussion of the probable early date of the site based chiefly on the discovery of a coin of Domitian, and the author's theory of Vespasian's route into Britain as it affected Hayling.

Wood: A Manual of the Natural History and Industrial Applications of the Timbers of Commerce. By G. S. BOULGER, F.L.S., F.G.S., etc. Second edition, revised and enlarged. (London: Edwin Arnold. 1908.)

THE first part of Professor Boulger's concise but comprehensive book treats "of wood in general," and contains seven chapters on the origin, structure, and development of wood, the recognition and classification of woods, their defects, the selection, durability, seasoning, and storage of woods, the uses of woods, our sources of supply, and testing wood. In all these chapters there is much that will be interesting to the architect and builder, but perhaps the most generally useful are the three chapters on the defects, seasoning, and uses of woods. As an example of the author's methodical and exhaustive treatment of his subject the third of these chapters may be cited; it is divided into a number of sections dealing with shipbuilding, submerged structures, strength timbers, railway sleepers, mining timber, telegraph poles, building, wood-paving, shingles and fencing, carpentry, carriage building, furniture, veneers, turnery, walking-sticks, engraving, musical instruments, miscellaneous uses, cooperage, packing-cases, crates, paper pulp, fuel, charcoal, and distillation of wood, dyeing and tanning. In each of these sections the principal kinds of wood used for the special purpose are mentioned, and in some cases their advantages and disadvantages are briefly described. Part II. of the book is entitled "Woods of Commerce: Their Sources, Characters, and Uses," and contains short accounts of about a thousand different woods, arranged alphabetically according to their popular names. No fewer than forty-one different kinds of so-called oaks and forty-seven different kinds of pine are described. The distinctive microscopic structure of woods—a subject outlined in the first two chapters of the book—is more fully considered in an appendix, the text being illustrated by forty-eight plates from Mr. J. A. Weale's admirable series of micro-photographs. These plates show the structure of certain kinds of wood magnified thirty diameters. A full index completes this excellent book.

Logarithms and Trigonometry for Engineers and Surveyors. By ERNEST R. MATTHEWS, A.M.Inst.C.E., F.R.S.E., and T. G. HOWES THOMAS, A.M.Inst.C.E. (London: The St. Bride's Press, Ltd. 1908.)

CHAPTER I. of this little book explains briefly the manner in which common logarithms are used in addition, subtraction, multiplication, division, involution, evolution, and proportion, and gives the factors necessary for converting Common to Naperian Logarithms, and *vice versâ*. The chapter relates throughout to the well-known logarithmic tables published by W. & R. Chambers. In view of the facts that the last-mentioned volume contains a Preface wherein the nature and uses of logarithms are fully stated and illustrated by numerical examples, and that equally simple instructions are given in many other books of tables and numerous reference books for engineers and surveyors, we are at a loss to understand why the authors should have thought it necessary to publish the chapter to which we now refer, the only novel feature it possesses being three examples by Messrs. Matthews & Thomas showing the use of logarithms in simple hydraulic calculations.

Chapter II. is little more than a collection of trigonometrical definitions and ratios, with some explanatory matter and a few examples, essentially similar to those to be found in books possessed by every engineer and surveyor. A table of logarithms and a table of natural sines complete a book which, notwithstanding some intrinsic merits, must be regarded as to some extent a work of supererogation.

Transactions of the Institution of Civil Engineers of Ireland: Seventy-third Session, 1907-8.

DURING the session, whose proceedings are recorded in the present volume, only five papers were contributed, but the subjects so brought forward for discussion were all of considerable interest. In dealing with "The Quebec Bridge Disaster" Dr. W. E. Lilly referred to the remarkable wave phenomena occurring in connexion with the secondary flexure of columns and to the point that the bearing of these phenomena upon the failure of columns is important, although not taken into account by ordinary formulæ. In his opinion the failure of the compression members of the Quebec Bridge was due to the fact that the effects of secondary flexure had been neglected. By way of emphasising this contention the author brought forward the results of further experimental work bearing on the subject, and pointed out the respects in which the compression members were defective as judged from his standpoint. The experimental work described by Dr. Lilly was conducted on columns of very small size, and it is to be desired that money may be found for carrying out research work on a larger scale in the same direction.

"Trinidad Lake Asphalt" is the title of a paper by Mr. M. W. Foley describing the volcanic crater which has been filled up with bitumen to form the celebrated lake. It is possible to walk over the whole surface without danger except near the middle, where the asphalt is liquid and its depth unfathomable. Notwithstanding the enormous quantities of asphalt removed, sometimes amounting to 20,000 tons in a single month, there appears to be no risk of exhausting supplies, as the author states that excavated patches are rapidly filled up in about two days by a fresh eruption from the volcano. About sixteen years ago a series of borings was made to the depth of over 130 ft., entirely through the bitumen, which, as far as the author could ascertain, possessed the

* "L'Art Gothique et de la Renaissance en Chypre," 1899.

same qualities as that on the surface. Deeper boring became impossible owing to the moving of the asphalt and the absorption of the boring cylinder. The paper concludes with some notes on Trinidad land asphalt and various methods of employing asphalt in architectural and engineering practice.

Mr. Francis Bergin described the Kildare sewerage works, commenced in 1900, and constituting one of the first installations of the bacterial system in Ireland. The paper is a very practical one, giving an account of the author's personal experience, the difficulties he met, and the manner in which he overcame them. Another contribution of equal merit and somewhat allied character was the paper by Mr. J. G. O'Sullivan on "Works in Connexion with the Proposed Additional Storage Reservoir at Roundwood."

"The Protection of Engineering Structures from Lightning," by Mr. J. T. Jackson, included a concise summary of rules for the protection of buildings, mainly taken from the Reports of the Lightning Rod Conference (1882) and the Lightning Research Committee (1905). The paper was somewhat lacking in practical details, but certainly had the effect of eliciting a discussion which, as now published, usefully supplements the remarks of the author.

Society of Engineers: Transactions for 1907. (London: E. & F. N. Spon, Ltd. 1908.)

Among the papers reprinted in this volume one by Mr. E. T. Stead describes the construction of the Connaught Bridge, Natal—a structure comprising twelve steel girder spans, each from 74 ft. 8 in. to 77 ft. 4 in. long, supported by intermediate steel cylinder piers. The most interesting part of the paper is that referring to the sinking and skin friction of the cylinders. The use of gelignite as an explosive to aid the sinking of cylinders which could not be induced to descend under load seems to be somewhat hazardous practice likely to cause injury to the bottom lengths of the cylinders, as well as to disturb the strata to an undesirable extent. "The Renard and Sourcouf Road-Train System," discussed by Messrs. Thwaite and Thorpe, is one calculated to reduce the cost of road maintenance, because in a train of the kind described the weight carried and the driving stresses are distributed over a greater number of wheels than in ordinary road locomotives and trailers. Unfortunately the laws of Great Britain do not permit the Renard system to be used, as at present not more than three linked vehicles may be drawn along any road, and speed is limited to a rate absolutely useless for passenger traffic and very slow for goods traffic. "Waterworks Constructions in America," by Mr. E. R. Matthews, and "Subaqueous Operations," by Mr. H. B. Thomas, are two other papers of considerable interest.

American Society of Civil Engineers Proceedings, Vol. XXXIV. Nos. 6 and 7. (New York: 1908.)

The *Proceedings* of this society for August (No. 6) is of far more than customary proportions, and constitutes a volume of nearly 500 pages.

"Catenary Trolley Construction" is the title of a paper by Mr. Oliver S. Lyford, jun., discussing the special features involved in the problem of providing an overhead system for electric operation on railways using steam previous to and during electrification. The author refers particularly to work executed on the Denver and Interurban line of the Colorado and Southern Railroad, which is the twelfth large American system to inaugurate electric traction. It is worthy of note that the single-phase system has been selected by most of the companies whose decision to electrify their lines was made after the commercial success of single-phase working has been demonstrated.

"The Sinking of the Piers for the Grand Trunk Pacific Bridge at Fort William, Ontario, Canada," by Mr. H. L. Wiley, is a contribution of moderate length, its formidable title notwithstanding. The two river piers, one constituting a pivot for the swing girder span, 258 ft. long, consist of steel shells filled with concrete. The shells were sunk to rock bottom, at the average depth of 60 ft. below water level, pumped out, filled with concrete, and completed by masonry. A commendable feature of this paper is that the author gives an account of some troubles experienced in sinking the pivot pier and the means by which they were overcome.

"The Hydro-Electric Development and Transmission Lines of the Canadian Niagara Power Company" are described by Mr. A. H. Van Cleve. Fortunately all the land adjoining the Horseshoe Falls and thence nearly down to Lake Ontario is included in Queen Victoria Park and the Park Reserve. Therefore these works could only be executed by arrangement with the Park Commissioners, who very properly demanded that the design of the works and the manner of their construction should be of approved character. The masonry bridge over the canal inlet is a structure to which no exception can be taken, but the power-house is a monstrous building, about 68 ft. wide by nearly 300 ft. long, and will ultimately reach the length of 588 ft. An attempt has been made to give a pleasing appearance to this long shed by building the walls of blue limestone blocks, covering the roof with green tiles, adding a broad copper cornice, and providing bronze entrance doors at one end. But nothing can take away the businesslike look of the structure, and the best thing would be to hide it from view by a small plantation of trees and shrubs.

The remaining pages of the volume consists of contributions to the discussion of papers previously read, some of the most interesting topics being "The Effect of Temperature Changes on Masonry," "The Maintenance of Macadam and other Roads," and "Irrigation." Several of these contributions are almost worthy of being ranked as papers themselves.

In the *Proceedings* for September (No. 7) a lengthy and somewhat argumentative paper by Colonel H. M. Chittenden, Corps of Engineers, U.S. Army, is presented with the purpose of eliciting facts concerning "Forests and Reservoirs in their Relation to Stream Flow, with Particular Reference to Navigable Rivers." While professing sympathy with the present movement for the conservation of natural resources in the United States, the author seeks to controvert the accepted view that forests have a beneficial influence on stream flow. The related subjects brought forward are of much importance to the world, and their full discussion by a body such as the American Society of Civil Engineers cannot be other than beneficial. The same part of the *Proceedings* contains an able contribution by Professor Ira O. Baker to the discussion on "The Maintenance of Macadam and Other Roads," attention being devoted chiefly to ordinary country highways described as "earth roads." Notwithstanding the perpetual cry of motorists for tar-macadam, the earth road will always remain, and its continued improvement on the lines set forth by Professor Baker, among others, is clearly to be desired.

Das Deutsche Rathhaus der Renaissance. By August Griesbach. (Berlin: Edmund Meyer; 1907.)

Dr. Griesbach has chosen for his subject that fascinating period in which Gothic gradually gives place to Renaissance; and some of his examples are so delightful that one feels an added resentment against the perpetrators of the later Baroque work. The volume is divided into two parts; the first half deals with individual Rathhouses, grouped according to provinces; the second half contains critical analyses of elevations, plans, and local characteristics.

The author points out how, during the XVIth century, the Rathhaus was often the only large civil building in the place, and therefore it possessed much greater importance and significance than is the rule to-day. Formerly it was the focus of the town; the square was in proportion to it, all the principal streets led up to it, the main façade was designed with reference to its effect from the chief approach, and this concentration of ornament on the main façade can be considered as a peculiarity of the Renaissance. The Middle Ages dealt out equal treatment to all the elevations; but nowadays the increased size of modern town halls often renders it advisable to use a simpler treatment for the more utilitarian parts of the building. This is foreshadowed at Augsburg by Holl, who wished to give his main elevation its full value, and so set back the offices in a simpler wing.

Till the middle of the XVIth century, in common with all other buildings, the Rathhaus retained many Gothic features; the compact block-plan, the high gable, and the many dormers. Gradually, however, the Renaissance feeling for breadth rather than height showed itself by the addition of wings, the flattening of the gable, and that symmetrical arrangement of dormers which emphasises the horizontal rather than the vertical line. This tendency towards horizontality is increased by the disuse of the gable-end as the principal façade and by the substitution of the long elevation as one side of the square.

Numerous examples are quoted in illustration of each feature and characteristic pointed out. While the mere collating of so many buildings of one period is a most useful achievement, Dr. Griesbach adds to the value of his book by the very full references he gives to other works on the same subject; so that one knows exactly where to seek further historical or pictorial details. This latter is very necessary, as the drawings which illustrate the present work leave very much to be desired. For the most part the scale is much too small, as with Münden and Paderborn; and when a larger subject is given a full page, as with Bremen, the unskilful drawing in no way renders the effect of what must be a very charming building. One could wish that more of the illustrations had been entrusted to Dr. Friedrich Schöne, whose "Dettlebach" is by far the most pleasing drawing in the book.

Um 1800. Architektur und Handwerk im letzten Jahrhundert ihrer traditionellen Entwickelung, herausgegeben von Paul Mebes. (F. Bruckmann: Munich: 1908.)

Herr Mebes, in his work entitled "About 1800," pleads for a wider recognition of the excellencies in the style in vogue during the XVIIIth century and for a short period subsequently. The author feels that for practical purposes the modern methods of studying architecture are wholly wrong. He suggests that the student should first grow familiar with and appreciative of the last phase of traditional development in architecture, *i.e.*, the XVIIIth century, whose buildings breathe a spirit quite in harmony with our times. He considers that the study of earlier styles, which are too ancient to offer models answering modern requirements, should be left to such time as the creative faculty requires stimulating. In order to prove the entire suitability of the XVIIIth-century style to our needs, and to incite students to return to and carry on the delightful work of their fathers, the author has collected in this first volume over 350 fine illustrations of sound, simple designs for public buildings and dwelling houses, churches and chapels, flights of steps, front doors, ironwork and monuments. Germany is particularly rich in attractive examples of this period, which, however, are too often overlooked on account of their sobriety, and require to be forced on the notice of casual observers by such a publication as this.

Wohnung und Hausrat. Beispiele neuzeitlicher Wohnräume und ihrer Ausstattung von HERMANN WARLICH. (F. Bruckmann. Munich: 1908.)

IN his publication, "The Furnishing of the Home," Herr Warlich offers a well-deserved tribute to the excellent work done by artists of various nationalities who have responded to the new and increasing demand for beauty and culture in the home. The book, as its title announces, is a collection of examples of modern house decoration, furniture and fittings generally, and should be instrumental in furthering this movement towards higher ideals in the so-called minor arts. This volume may be considered as a sequel to a work lately published by the same firm, "Country House and Garden," which was compiled by Hermann Muthesius, one of the keenest appreciators and ablest judges of the modern art movement. The 240 pages of photographic illustrations contain examples for every requisite in house furnishing from fitted furniture to waste-paper baskets, including textile fabrics, china, glass and metal wares. The examples have been chosen with great care and discrimination, as the book is intended before all things to awaken the feeling for simple, good internal decoration and the love for the beautiful.

A Treatise on Colour Manufacture. By GEORGE ZERR and DR. RUBENCAMP. Authorised English edition by DR. CHARLES MAYER. (London: Charles Griffin & Co., Ltd. 1908.)

THE translator of this German treatise has done his work so well that the foreign origin of the book is betrayed only by its mention of a Continental author, journal, or place in many cases in which an English writer would have referred to a British publication or locality. Much of the information it contains has already appeared in English books; but the treatise is more complete than any other on the same subject which has passed through our hands, and the authors appear to be well acquainted with all recent discoveries and innovations relating to colour manufacture. The book is called "a guide to the preparation, examination, and application of all the pigment colours in practical use." This is an ambitious claim, but it is justified by the contents of the treatise. The authors, translator, and publishers have all done their work well.

In its modern phases, colour manufacture is essentially a scientific industry. Practical acquaintance with the methods of preparing colours adopted by an earlier generation will not qualify a man to control a modern colour factory. The authors of this book have freely used chemical symbols and nomenclature, but although these would not have been understood by many successful colour-makers of the XIXth century, they will now be unintelligible only to the incompetent.

Several tables showing the behaviour of different pigments when treated with certain reagents are given, and these will be very useful to the colour chemist. The table (p. 580) which shows the solubility of various substances in water would be more serviceable if it showed the temperature of maximum solubility. It merely states the solubility in "cold" and "hot" water, usually without mention of the temperatures of the cold and hot water. That the table in its present form may mislead will be seen by reference to the solubility of Glauber salt. According to the table, water at 0° C. will dissolve 5 parts, and hot water will dissolve 42·5 parts; but on page 6 it is stated that Glauber salt is less soluble in hot than in cold water. As a matter of fact, the temperature at which this salt is most soluble is 33° C., and when the temperature of the water is higher than this the salt is less soluble. This is correctly stated on page 317.

On page 2 it is erroneously stated that picric acid is "the oldest of all organic dye-stuffs." The authors probably intended to write the oldest of all *artificial* organic dye-stuffs, for many organic dyes were used centuries before picric acid was discovered. The book has, however, very few defects, and we have no doubt that it will receive universal recognition as one of the best works of reference on colour manufacture.

Specifications for Decorators' Work. BY FREDK. SCOTT-MITCHELL, Lecturer on Decoration to the City and Guilds of London Institute and the London and Surrey County Councils. (London: The Trade Papers Publishing Company, Ltd. 1908.)

THIS is the fifth volume of "The Decorator" series of practical books. It is a small, unpretentious book, and is intended to serve as a guide to architects when drawing up specifications for decorators' work. Typical specification clauses for all ordinary descriptions of painters' and decorators' work are given, and some useful information concerning the terms and materials used in decoration is added in the concluding chapters. Average charges for painting, varnishing, and paperhanging are quoted in Chapter XV., and although the charges for such work must necessarily vary under different circumstances, the figures here given may be serviceable. Some notes which may assist architects in detecting faulty practices which yield unsatisfactory decorative results are given in the chapter on "Points for Overlookers." In this chapter Mr. Scott-Mitchell, when referring to priming for new wood says, "It is not uncommon for painters to regard priming as an opportunity to use up old 'fat' paint composed of accumulated leavings of all kinds of work," and points out that good paint only should be used for priming. The final chapter contains copies of two forms of agreement for painting and decorating contracts drawn up by the Incorporated Institute of British Decorators. Contract No. 1 is intended to be used where an architect is employed, and No. 2 where no architect is engaged.

Most experienced architects have already acquired the greater portion of the information contained in the book, but we commend it to students and all whose experience in specifying for and superintending decorators' work is limited.

Mensuration Made Easy: or, The Decimal System for the Million. By CHARLES HOARE. Twenty-fourth edition. (London: Effingham Wilson. 1908.)

WRITTEN nearly fifty years ago for the artisan and mechanic, before decimal arithmetic and technical subjects were taught generally, this little book quite deserves a word of commendation even to-day. After giving a series of rules for operating with decimal numbers, the author devotes the remainder of his work to the application of the decimal system to the solution of problems in mensuration and mechanics. Notwithstanding its elementary character, this textbook contains much that should be found useful, and might be studied with profit by all misguided or prejudiced people who do not favour the decimal system.

Practical Hints on Modelling, Design, and Mural Decoration. By HENRY F. W. GANZ. (London: Gittings & Co.; Philadelphia: J. B. Lippincott & Co. 1908.)

"PRACTICAL HINTS ON MODELLING, DESIGN, AND MURAL DECORATION" is a remarkably clever little handbook fathered by Mr. Alfred Gilbert and Mr. Frank Rutter. Mr. Ganz is an ambitious young author who sets himself the task of providing the student with a practical treatise on the three arts of Design—Architecture, Sculpture, and Painting, under the above title, in a little book of 120 pages. The work consists in a series of short essays, thirty-four in number; vigorous and original as many of them are they illustrate rather Mr. Ganz's versatile gifts than the subjects in hand. The book is illustrated with pen drawings by the author and photographs.

The Annual of the British School at Athens. No. XIII. Session 1906-1907. (Macmillan. 25s. net.)

THIS volume of the *Annual* is probably, taken as a whole, the most interesting that has appeared for some years, from before the days when the work of the School began to be centred at Sparta and the gigantic interests of Knossos swamped everything else. The record of the present volume is prior to the latest discovery at Sparta, that of the VIIth century temple, which should make the next volume, or possibly the next again, of particular architectural interest. The editing has improved since our last review, and the main work of the School in Laconia is kept consistently in the forefront—an advantage in every way; but the index is not very well arranged, the last or general section of the book not being kept quite distinct in it from the topographical section.

With regard to the School work proper in Laconia, it has taken some years to get to the root of the matter, and we now have, for the first time, adequate plans and sections. After a short account of the season's work by the Director, Mr. Dawkins, Mr. Wace contributes a paper on the city walls and the stamped tiles belonging to them. These papers would be much better of some adequate sections of the wall and geometrical drawings of the tiles to supplement the descriptions.

Mr. Dawkins contributes the longest article in the volume on the Sanctuary of Artemis Orthia, of which we now have a respectable plan and section, showing a circle of raised seats with an arena in the middle and the temple cutting into the circle, its portico facing into the arena. The remains of the temple—which is of Roman date and portico-in-antis or prostyle—are of the most meagre description. The most interesting part of the article is the description, with good illustrations, of the archaic finds, particularly the ivory fibulæ plaques. The resemblance of Fig. 19 to one of the metopes at Selinus is not pointed out. There is hardly sufficient comment on the interest of the ivory chair illustrated on page 96. It recalls both Apulian and Indian art.

Mr. Droop follows with two articles—one on the early bronzes and another on the painted pottery—and Mr. Dickins with a description of the Sanctuary of Athena Chalkioikos—plan, section, and finds—which the Director refers to in his prefatory note as "perhaps the most interesting and important [discovery] of the whole campaign." This remark is quite justified when one considers the truly magnificent black-figured amphora illustrated on Plate V.—a find of which any excavation might be proud. The four-horsed chariot is certainly one of the finest things of its kind in the whole range of Greek vase-painting.

There are other articles on Laconia, and two on topography which we have no space to mention, by Messrs. Wace, Dickins, Tod, Tillyard, Forster, and Woodward.

In the general part of the volume we begin with an architectural series. Mr. Traquair on Mediæval Fortresses of the North-West Peloponnese; Mr. Van de Put on some Armorical Insignia; and Mr. Hasluck on "Bithynica," the last being of particular interest and illustrated by architectural plans and photos. Mr. Hasluck also contributes, later on, another of his useful notes on British Museum MSS. relating to Levantine geography, a subject which he is making specially his own.

The three concluding articles are not the least important in the volume. Mr. Dickins, in the continuation of his study on Damophon of Messene, treats of that sculptor's great

seated group at Lycosura. The choice of such a subject is admirable, and the method practical and thorough. The first part deals with the actual restoration, the second—a valuable one—with the mechanical construction of the group, and the concluding note is on Damophon's style. The illustrations are excellent. Mr. Peet's article on Early Ægean civilisation in Italy is interesting in itself, and is wisely placed beside Dr. Mackenzie's third article on "Cretan Palaces and the Ægean Civilisation," which is also ethnographical. It is only necessary to note here that Dr. Mackenzie's subject-matter is of absorbing interest, as bearing on the Homeric question and the origins of Greek art. His study of the subject, we are glad to say, is to be continued.

The photographic illustrations in the text are rather better than usual, but it is still necessary to point out that such views as those on pages 46 and 47 are hardly worth publishing except on plate paper. There are fourteen plates at the end of the volume, including six double ones and a good general plan of the site of the Sparta excavations.

MAGAZINES AND REVIEWS.

In the *Burlington Magazine* Mr. Selwyn Image takes us by surprise by an article on "The Serious Art of Thomas Rowlandson," *i.e.*, that part of his art which was not caricature. It must have been a small part, and even out of the eight examples given we should say that three are caricatures, and two others have a strong caricature element. However, it is well to be reminded that Rowlandson could draw seriously and very finely; "Rustic Courtship" is a charming idyllic sketch, and "A Family Squabble" a very powerful piece of character and expression.

In the *Art Journal* the serial article on "The Making of Carpets" is continued, with some illustrations, not all of equal merit, and the majority are marked not by the names of the designers but of the manufacturing firms. Nos. 37 and 38, by H. and M. Southwell, look like the two best, though of course it is difficult to tell apart from the colour scheme. No. 40 (Tomkinson & Adam) in more Oriental style, ought to be a good one if the colour is good.

The *Architectural Record* (New York), under the title "Great Buildings Described by Great Writers," gives a translation from a description of the Parthenon from the "D'Athènes à Baalbeck" of Charles Reynaud, a clever but hardly a "great" French writer of the first half of the XIXth century. The idea of giving the impression produced by great buildings on men of literary genius is however a good one, and we presume is to be continued in other examples. An article on "Recent Churches in St. Louis" seems to indicate, from the illustrations, that North Italian influence is a good deal prevalent there.

The *Berliner-Architekturwelt* contains illustrations of three very curious specimens of recent Berlin street architecture; all very clever and original in detail, though anything but pleasing in general design.

Public Works, as usual, contains quite a collection of practical original articles in addition to notes on works in progress and projected in various parts of the world. Mr. F. W. S. Stanton, in concluding a series on "Erosion of the Coast and Its Prevention," deals mainly with reclamation and the design of sea walls; Mr. A. S. Jennings gives some "Notes on Specifications for Painters' Work," which are useful as far as they go; Messrs. C. E. A. Winslow and E. B. Phelps discuss "Recent Tendencies in Sewage Disposal Practice," in an article whose value is increased by the comparison of practice in this country, Germany, and America; and Mr. James Swinburne considers the question of "Indoor Illuminants" in a manner which should appeal particularly to our readers.

The *Fortnightly* contains an important article by Mr. D. G. Hogarth on "Some Recent Archæological Discoveries," mainly with the object of pointing out how and in what direction these discoveries necessitate a revisal of hitherto accepted historical theories. The most important of these possible revisals is (as we have often thought it would be some day) that which may be rendered necessary by further explorations in Asia Minor, especially in Phrygia and Lydia. As Mr. Hogarth observes:—

"One of the things most devoutly to be desired is that someone should excavate the Rock monument region of Phrygia. Whoso will undertake that work should throw as much light on Greek origins as will the future excavator of another derelict site of the first importance, Lydean Gardes. For we know even less of the Lydean area than of the Phrygian, and yet it is certain that its culture went for even more in the making of Greek civilisation."

In the *National Review* Mr. E. Alfred Jones gives a description of "The Tsar's Old English Plate." It will come as a surprise to many readers to learn that the Tsar's collection of old English silver plate surpasses even the collection at Windsor Castle in historical interest and intrinsic value. Many of the articles were gifts from different English Sovereigns. A description of the principal objects is given; they are to form, we are glad to see, the subject of an illustrated book by the writer of the article. He observes that the collection is very rich in Jacobean plate, of which there are forty pieces.

"Unfortunately, the inventories of the English royal plate melted by Charles I. convey no adequate idea of the splendour of many of the vessels, and therefore the gigantic size of the leopards and other unique objects at Moscow comes as a surprise. No single vessel now exists in England comparable in size to the two massive pairs of jugs, over 2 ft. high, with London date-letters for 1604–5 and 1615–16, lavishly decorated with embossed and engraved work, and fitted with large serpent handles and dragon spouts."

In the *Nineteenth Century* Captain Swinton, L.C.C., writes an article on "The Chaos of London Traffic," the main point of which is that the whole problem requires (as has been so often urged before) to be taken in hand by a directing body appointed for that purpose. He makes some suggestions of his own; one is that there should be a shallow subway from the Mansion House to Liverpool-street, taking the Bank on its way, with a tram or a moving platform to be available without charge, in order to avoid some of the cross traffic to Liverpool-street. We doubt, however (and he seems rather to doubt himself), whether a shallow subway would be possible, in view of the sewers and water and gas pipes, etc. He proposes also that after a period of (say) five years no more horse-cabs should be licensed to ply within the London radius, but we do not see that that would do any good; it would only mean that the number of horseless vehicles would be proportionately increased. Nor do we think he is correct in saying that "even to-day no one will take a hansom if they can get a 'taxi.'" Many people still prefer the hansom, the use of which is in fact little diminished. To the same number Mr. Beresford Chancellor contributes an article on the "Royal Open-air Statues of London"; an article historical, not critical; indeed the writer does not seem quite aware what poor things most of them are.

To *Harper* Mr. F. A. Black, F.R.S.E., contributes a concise but useful article on "The Earth as a Magnet," including a slight sketch of the history of the variations of the compass, as well as of its curious divergency of variation at different places, and at different times of the day in the same place. Some of these facts are certainly not very generally known. The point of the title of the paper is that the earth is itself a magnet on a large scale. Concise and simply expressed as the article is, it embodies the latest knowledge or theory on the subject.

"The Stones of Oxford" is the subject of an article in the *Pall Mall Magazine*, illustrated by a number of sketches by Mr. Hanslip Fletcher; and there is an article on "The Art of Charles Keene" by Mr. Walter Emanuel, who has been a collector of sketches by Keene, and gives reproductions from some not hitherto published.

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